EMERGENCY AND TRAUMA CARE

FOR NURSES AND PARAMEDICS

THIRD EDITION

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CLAIR RAMSDEN
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MARGARET FRY
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EMERGENCY AND TRAUMA CARE 3e

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FOR NURSES AND PARAMEDICS

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CLINICAL CONCEPTS AND SYSTEMS

FOREWORD

Health and wellbeing are fundamental human rights. We all have the right to be healthy and to be well, regardless of our standing or station. Australia enjoys one of the most advanced and socially progressive healthcare systems in the world, and emergency and trauma care are fundamentally critical components of this system and, indeed, all healthcare systems globally. The same cannot be said, regrettably, for many other parts of the world where healthcare systems are underdeveloped, are chronically under-resourced and, in some cases, in contexts where human rights are disregarded, undervalued or absent.

Emergency clinicians play essential roles in complex and dynamic healthcare systems, and in doing so, they are presented with challenges that are peculiar to them and their specialty. They assess and initiate care for patients of all ages, with varying degrees of clinical urgency and severity, and where patients are typically undiagnosed and undifferentiated. They see and work with patients and their families at their most vulnerable, with an ever-increasing demand for healthcare that routinely outstrips supply and available resources.

Emergency and Trauma Care for Nurses and Paramedics 3e provides emergency clinicians with comprehensive, contemporary, practical and evidence-based information necessary to support the ever-increasing demands and needs of their professional practice.

Importantly, it serves as a guide for emergency clinicians to recognise the inherent value of each person, regardless of their background, where they live, what they look like, what they think, or what they may believe, as is said for all of their colleagues in the other health professions. The delivery of modern healthcare, in particular emergency and trauma care, must be based on the fundamental human rights principles of dignity, equality and mutual respect across all cultures, religions and philosophies. The care that emergency clinicians provide must be such that patients and their families feel safe, believe they are treated fairly and appropriately, and that they have the ability to make genuine choices that affect the options and trajectory of their care.

It is my pleasure to congratulate the editors Kate Curtis, Clair Ramsden, Ramon Z. Shaban, Julie Considine and Margaret Fry and all contributing authors on this state-of-the-art text. *Emergency and Trauma Care for Nurses and Paramedics 3e* will be a valuable resource for everyone working in emergency care settings, irrespective of the setting, including emergency departments, other hospital-based environments and the pre-hospital setting.

I commend *Emergency and Trauma Care for Nurses and Paramedics 3e* to you as a leading resource to enable you to provide high-quality, safe, effective and timely emergency care to patients and their families for their human rights.

Professor Gillian Triggs
Vice-Chancellor's Fellow, University of Melbourne
Chair, Justice Connect

PREFACE

Emergency and Trauma Care for Nurses and Paramedics 3e is a comprehensive, contemporary, practical and evidence-based resource for emergency and trauma nurses, paramedics and other healthcare workers, and students working in urban, rural and remote settings. It provides everyday clinicians with invaluable information relevant to their local practice environment that is informed by best-available global evidence. Our 85 contributing authors are recognised practitioners of standing in Australia or New Zealand and were chosen for their expertise to ensure relevant, practical information.

Emergency and Trauma Care for Nurses and Paramedics 3e is organised into four sections. Section 1 comprehensively documents the foundations and development of paramedic and emergency and trauma nursing practice, as well as the fundamentals of emergency care, including quality and safety, ethics, leadership and patient education. Section 2 addresses the clinical and health service system concepts of scene assessment, patient assessment, triage and the physiology of emergency care, and contains a chapter featuring essential clinical skills, which are cross-referenced throughout this edition. Section 3 then explores contemporary recognition and management of specific body system emergencies, including cardiovascular, respiratory, neurological and endocrine. Other areas of emergency are also covered in depth, including toxicology, envenomation and ocular and environmental emergencies, as well as end-of-life care. Emergency care for unique population groups, including the elderly, disabled, obstetric and paediatric patients, is also presented. Section 4 of the text provides a detailed review on major trauma assessment and management, examining trauma systems, trauma assessment and trauma to specific body regions.

Throughout the 49 chapters, cross references are made to other areas of the text that are of relevance. The 540 figures and 255 tables actively support the hands-on clinical approach of the text. Clinical assessment, physiology, decision-making and rationale for interventions of common and not-so-common emergency presentations are provided. Case studies are provided at the end of each chapter to enable consolidation of knowledge for practice.

Emergency and Trauma Care for Nurses and Paramedics 3e reflects expert knowledge, published research and literature available at the time of production. It is important that readers continue to search for the most recent sources of appropriate information to guide their practice. To assist the reader in this, useful websites are also provided at the end of each chapter. Feedback from readers is welcome so as to facilitate the growth and development of the disciplines of emergency and trauma care and the professions who practise it.

We commend *Emergency and Trauma Care for Nurses and Paramedics 3e* to you in support of our shared efforts to provide high-quality, safe, effective and timely emergency care for patients and their families.

Kate Curtis
Clair Ramsden
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July 2019

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- the chapter contributors, some of whom have written for the first time. Their patience, persistence, expertise and knowledge are greatly valued. This book has been written by an extremely skilled expert group of clinicians and academics.
- the team at Elsevier, in particular Libby Houston, Vanessa Ridehalgh, Shravan Kumar and Margaret Trudgeon.
- the reviewers, who spent time and effort ensuring the content is accurate, relevant and up-to-date and that the editors have not overlooked any pertinent subject matter.

On a more personal note, we would particularly like to thank our partners (George, Jason, Sally and Paul), children (Sarah, Beatrix, Edward, Grace and Lewis, Aimee and Aaron), family and friends who have endured the many months of hard work and been tremendously patient and encouraging. You have our sincere appreciation and gratitude.

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SECTION 1

FOUNDATIONS OF EMERGENCY CARE

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CHAPTER 1

EMERGENCY NURSING IN AUSTRALIA AND NEW ZEALAND

MARGARET FRY, RAMON Z. SHABAN AND JULIE CONSIDINE

Essentials

- Emergency departments (EDs) are a key entry point for patients entering the acute hospital system.
- Clinical care demands mean that EDs share similar characteristics.
- To meet service demand and optimise workforce supply and retention, staff roles and new models of care need further consideration and evaluative research.
- Clinical performance indicators provide an opportunity to compare services and quality and to strive for consistency.
- The cultural context of care has embedded beliefs and values which drive behaviour, activities and interactions.
- Emergency nurses are responsible for direct patient care and management, policy, education and research within the specialty of emergency nursing.
- Professional development is an ongoing process by which an emergency nurse identifies learning needs and addresses them to maintain safety of practice.
- Self-direction and reflection on practice and learning needs are essential to focusing professional development activities.
- Continual professional development has a positive impact on healthcare outcomes and relies upon a strong partnership and a shared responsibility between individual practitioners and their employers.
- Professional development can take many forms; both formal and informal activities can be effective in their own right.
- All emergency nurses need to champion the translation of research and thereby anchor practice in best evidence.

INTRODUCTION

This introductory chapter provides an overview of the specialty of emergency nursing and the function of emergency departments (EDs) across Australasia. The key challenges, research and professional and management issues confronting emergency care clinicians are explored. A brief overview of Australasian ED role delineation is provided. Given that emergency nursing occurs within a specific context of care, embedded cultural beliefs which drive and motivate behaviour and interaction are discussed. The development of the different nursing clinical roles and specialist education and industrial awards are described.

The challenge for emergency nurses is in (re-)designing the Australasian healthcare system to better ensure patient safety while accommodating an ageing

population, population growth, increased chronic disease rates and workforce shortages. To reform the landscape of healthcare provision requires new ways of thinking that will reshape and define roles, models of care, activities and clinical expertise and thereby reduce the fragmentation of care that exists within and between sectors, while leading to greater consistency of practice and healthcare accessibilities and equity for patients.

Emergency nursing

Designated emergency departments (EDs) were first established in Australia in the early 1970s and functioned mainly as an after-hours patient entry point where a nurse from the wards came to monitor the patient's condition until the arrival of a doctor. However, the increasing number of patients presenting to EDs, demand for more emergency care, advances in technology and improvements in resuscitation procedures led to the need to expand services and create a specialty area for the delivery of emergency care. By 1985 these changes raised the expectation that both nursing and medical staff needed to become highly trained, specialised in emergency care and permanently based in EDs.[1]

The formation of formally designated EDs led to the establishment of emergency nursing as a discrete area of practice, evolving into a specialty practice over the ensuing 45 years. Emergency nurses deliver care to a diverse population experiencing episodic, abrupt, potentially life-threatening health or psychosocial conditions. Emergency care may require minimal intervention or advanced life-support practices. They require in-depth knowledge, skills and clinical expertise to provide care and to manage situations, such as patient overcrowding and the use of complex technology.[2]

Emergency nurses practise routinely in stressful environments and are required to make sound decisions, even when they are under considerable stress. They are proactive individuals who enjoy challenges and actively strive to professionally develop themselves. Emergency nurses are adaptive and responsive professionals who systematically engage and develop rapport with individuals from a diverse range of cultural and socioeconomic backgrounds.[3]

Emergency practice requires nurses to blend theoretical knowledge systems, past experiences, collated patterns of knowing and ways of doing, with a patient's physiological, interpersonal and communicative signs.[4] Convergences of these knowledge systems with cognitive domains that include assessment, diagnosis, treatment and evaluation skills, enable greater accuracy and speed in the decision-making, troubleshooting, prioritisation and delivery of emergency care.[5,6]

The practice environment of emergency nursing is as diverse as the nursing profession itself. Box 1.1 identifies some of the practice environments of Australasian emergency nurses. In keeping with the nursing profession as a whole, emergency nursing roles include assessment, diagnosis, patient care and management, referral, education, consultation, advocacy and research.

In Australasia, emergency nursing practice is guided by various professional and government bodies, which include the Nursing Council of New Zealand (NCNZ), New Zealand Nurses Organisation (NZNO), the Nursing and Midwifery Board of Australia (NMBA), Australian Health Practitioner Regulation Agency (AHPRA), the Australian Nursing and Midwifery Accreditation Council (ANMAC), the Australian Nursing and Midwifery Federation (ANMF), the College of Emergency Nursing Australasia (CENA), the Council of Remote Area Nurses of Australia (CRANA), and local, state, territory and federal governments. However, the demands of the clinical environment also determine the scope of practice roles in emergency nursing. Consequently, role function may vary between and within service providers. For example, emergency nurse roles in a teaching tertiary hospital may vary from those in remote, rural or regional areas.

BOX 1.1 Emergency nursing practice environments[7]

- Emergency departments
- Emergency treatment areas
- Minor injury units
- Military services
- Community health clinics
- Remote and very remote health clinics
- Industrial areas
- Multipurpose centres
- Māori health providers
- Medical centres
- Pre-hospital/retrieval services
- Disaster response teams

Emergency departments

The geographical landmass of Australasia (Australia and New Zealand) is vast—7,955,530 square kilometres—with a combined population in 2018 of over 29 million.[8,9] Throughout Australia the roles of EDs differ depending on the type of hospital, geographical location and position within the healthcare system network (Table 1.1). Within each designated level, physical design, function, staffing and resources are similar. New Zealand's ED role delineation structure is similar to Australia's (Box 1.2).

In the urban setting, most metropolitan and regional areas have a designated ED. However, rural, remote and very remote health centres have designated treatment areas/rooms that provide limited resuscitation practices. To be designated as an emergency department or service the facility must provide specialist medical officer and nurse cover, on-site diagnostic services and intensive care and surgical operating services.[10] While rural, remote and very remote centres have access to medical officers, nurses often assess and manage patients.

The New Zealand healthcare system is currently structured as 20 District Health Boards across 16 regions. These boards, inclusive of emergency services, were established to ensure the delivery, monitoring and evaluation of health services.[11] Similarly, Australian state and territory governments are responsible for health services, although service models vary. Australia has 287 and New Zealand 42 designated public hospital EDs.[12,13] Australia and New Zealand each has a national healthcare system that

TABLE 1.1 Australian emergency department distribution[14]

TYPE OF HOSPITAL	NUMBER
Major referral and specialist women's and children's*	30
Metropolitan (urban districts)[?]	54
Major rural and regional	45
Total*[?]	129

**Does not include 23 private hospital EDs, although 86% (19) are located in capital cities.*

[?]Does not include multipurpose rural centres (n = 66); excluded as they are not designated EDs.

BOX 1.2 New Zealand emergency department distribution[15]

T1 Higher-level tertiary
T2 Lower-level tertiary
S1 Secondary
S2 Subacute
Health centre/Rural and remote

provides universal free access to emergency services, free public hospital care, subsidised pharmaceuticals and out-of-hospital care. A reciprocal healthcare agreement exists between Australia and New Zealand.

Emergency care throughout Australasia is considered a right of citizens, and care should be of an appropriate standard and quality. The challenge for emergency care clinicians is the increasing complexity of the emergency environments and of the care being delivered in a context of rising patient presentation rates, an ageing population and increasing comorbidities.

The ED is one of the key entry points for patients entering the hospital system and provides an interface between the primary health and acute care sectors. Throughout Australasia, the increased patient attendance rate is largely due to an ageing population, decreased availability of general practitioner (GP) services, increased chronic disease rates and the availability of new technologies and procedures.[12] The need to deliver care for all age groups and respond to patients with minor injuries and illness through to critical or life-threatening conditions requires EDs to be responsive by having specifically designated clinical areas. Hence, EDs are largely configured in the same way, although size and bed capacity differ between individual departments.

Clinical environment

The clinical environment must be designed and allocated appropriate resources to meet the demands of a range of patient conditions and injuries across the life span, and so all EDs share similar architectural commonalities between sites that make them recognisable and consistent with each other. The organisation of ED work, purpose and function is shaped and ordered by patient case-mix and architecture. ED patient care is usually provided in a range of specifically designated geographical areas, which are further configured into waiting and ambulance arrival areas, triage, resuscitation, acute, sub-acute and/or fast-track/consultation areas. For mixed adult and paediatric EDs, best practice requires children to be allocated to a separate waiting, clinical and resuscitation area away from adult patients. There are also increasing calls to have elder-specific areas within EDs to meet the specific needs of older ED users. Increasingly, assessment or 24-hour short-stay units are being co-located within or near EDs, for example, short-stay mental health or medical aged assessment units.

Patients with critical and/or life-threatening conditions are best managed in resuscitation areas with appropriate lifesaving and continuous-monitoring equipment and enough to allow a range of skilled staff to provide care. Designated resuscitation areas are often resourced to provide care for both paediatric and adult patients.[16] Urgent patient conditions, with the potential for deterioration, need close monitoring for a period of time and are often located in an acute area where there is provision for continuous vital signs, and invasive and cardiac monitoring. In contrast, patients who self-present with minor injuries and illnesses can be managed in a fast-track and/or consultation-type area with equipment targeting minor procedure and/or illness management. However, some patient groups that might require isolation, privacy and/or reduced stimulation may be more appropriately managed in a single room, with or without continuous-monitoring capabilities. The diverse clinical environment of the ED is challenging, given the requirement for clinicians to provide care for patients across the life span and with diverse clinical presentations and comorbidities.[16]

The primary distinguishing feature of emergency nursing is the need to care for patients with undifferentiated diagnoses in a time-pressured environment, so the process of patient assessment is vital in these circumstances. Emergency nurses require in-depth knowledge and clinical expertise to provide care and manage situational events, such as patient overcrowding and complex technology.

Australian emergency nurses have a broad scope of practice and independently make complex clinical decisions. For example, in a resuscitation context, emergency nurses are responsible for decisions such as setting mechanical ventilation parameters; titrating medications such as vasopressors, sedation and analgesia; and managing advanced respiratory and haemodynamic monitoring, all of which carry high levels of clinical risk and are vital to patient safety.[17,18]

Emergency department workforce

The ED workforce is largely driven by patient case-mix, local demand and presentation rates. Therefore, workforce planning and staff ratios, development and work practice (re-)design should be focused on the challenge of making the patient's journey through the ED as efficient, safe and satisfying as possible.

The most appropriate staff ratio profile for an ED is unclear, and development of staffing models remains an urgent priority.[19]

Some, but not all, Australian states have legislated nurse-to-patient ratios in EDs, but they are blunt workforce tools and are not flexible to ED workload patterns or specific patient needs.[20,21] Greater clarity is required to understand and define the appropriate workforce model for EDs, which would also give shape to possible advanced practice emergency nursing roles.[10,22,23] Refer to Chapter 6 for further discussion on nursing ratios.

Nevertheless, roles within EDs are diverse and staff include nursing, medical, allied health, transport and administrative support and communication staff members.[14,15,19] The workforce profile of an ED is usually individually responsive to local demands and needs, and to patient presentation rates and acuity. The ED workforce analysis tool may assist in reviewing workforce profiles and future requirements.[24]

A diverse range of staff is needed to sustain the delivery of ED services. The emergency doctor's primary role is to assess, stabilise, manage and refer patients. They also oversee/supervise other junior medical staff providing care, including emergency medicine and other specialty trainees, career medical officers, locum practitioners, GPs and junior medical officers.[25] Emergency nurses undertake patient assessment, prioritise nursing care, initiate interventions and provide ongoing nursing management for the range of patients. EDs now offer a range of nursing roles that require varying levels of advanced knowledge, expertise and skills.[17] For example, the nurse practitioner[26–28] and clinical initiative nurse (CIN).[29–31]

The ED workforce is a major resource of and for the department. Hence, work practices may be one of the chief areas of attention for redesign in the future. Government and service strategies and policies need to focus on: increasing interdisciplinary teamwork and promotion of collaboration between disciplines; staff development to enable the acquisition of advanced skills and experience required for alternative models of care; building staff capacity and expertise of staff in allocating innovative tasks and roles while recognising experience, knowledge, skills, competencies and qualifications; and using technologies, if proven to enhance efficiency and ensure there is adequate support for implementation.

Workforce is clearly a crucial aspect of ED infrastructure.[19] Across Australasia, various EDs are developing innovative approaches to the deployment of emergency care clinicians, including extended practice for experienced nurses, nurse practitioners and allied health professionals being employed to provide autonomous assessment and treatment. The delivery of effective emergency care, in a prehospital and ED and acute care settings, requires innovative, flexible and collaborative systems that support creative thinking and research about the range and roles of staff working in the area.[6]

Support staff

The complexity of the ED environment requires dedicated support staff who can assist directly or indirectly with patient management, admission, disposition and/or discharge processes. The range of dedicated support staff essential to improve ED services and efficiency include clerical staff, clinical and communication support staff, volunteers, orderlies, transport/transfer staff, security personnel and cleaners.[14] Support staff require appropriate education and development and are essential for the efficient provision of ED services. Support staff are necessary to release healthcare workers from non-clinical tasks, enabling their focus to remain on patient safety, care and management.

Optimising work practices

Optimising patient service, flow and management has led to diverse extended practice roles being undertaken by nursing and allied health staff; roles and/or activities that were traditionally undertaken by medical staff. Emergency nurses have been able to undertake a range of extended patient-management activities through the establishment of reference tools such as clinical practice guidelines, clinical pathways and standing orders.[26,29] The medically endorsed patient-management guidelines have enabled emergency nurses to undertake an extended range of activities, including assessment, pharmacological and investigative interventions, and targeted management activities such as the commencement of intravenous fluids.[31] By initiating interventions for a range of patients, the experienced emergency nurse optimises work practices.[29,31] Significant improvements in ED services' flow and costs have been demonstrated in many EDs that have established such reference tools.[31,32] Reference tools such as clinical guidelines go some way to securing consistency within practice, and offer clinicians and managers the opportunity to make comparisons with other like services.

Communication support

Communication, both non-clinical and clinical, consumes a significant proportion of ED staff time.[33,34] The need to better coordinate and centralise non-medical communication is growing. Within many EDs the coordination of patient and staff communications requires a dedicated communications support role.[35]

In addition, communication processes concerning patient care and management are also growing in complexity as increasing numbers of healthcare clinicians and hospital managers become involved.[36] Shared decision-making about high-quality patient treatment, care and disposition has led to complex and multilayered communication processes. The communication support role provides a pivotal conduit to better facilitate the patient's journey and provide a consistent link between local, hospital and community engagement. Greater integration of communication processes between primary care and the acute care sector is needed. Refer to Chapter 8 for more discussion on decision-making.

A secondary advantage to having a centralised ED communication role is the ability for patients and relatives/family to have access to a consistent communication portal. Providing high-quality patient care is challenged by the pressures of communication in an emergency setting. Communication processes need to be considered within pre-hospital and emergency settings to ensure safety and alleviate patient, family and/or carer stress and anxiety. Clear information about emergency processing and care while in the ED should be provided systematically and consistently to patients, families and/or carers. Refer to chapters 6 and 8 respectively for further discussion on communication and safety.

Performance improvement

With an increasing demand and expectation on service delivery, EDs are challenged to provide consistent, safe and timely high-quality care. EDs have been proactively examining ways to provide a more satisfying and appropriate service. Hence much

has been done through examination of various practice models, at federal, state and local levels, to improve service delivery. However, consistency in ED practice remains elusive, as organisational comparisons are often difficult, given the (often significant) variation in local demand, population mix, geographical location, workforce characteristics and resource availability between sites.

Across Australasia, national accreditation organisations have sought to champion high-quality improvement programs for healthcare. These national accreditation bodies have provided various quality frameworks for healthcare evaluation, which are focused on demonstrating appropriate and consistent patient care practices, staff development and education practices and patient safety review processes. For example, The Australian Council on Healthcare Standards (ACHS) has introduced quality frameworks (such as the Evaluation and Quality Improvement Program National, known as EQuIPNational), which aim to facilitate evaluation and review of organisational practices to achieve greater consistency, safety and standardisation of care.[37–41]

Traditionally, throughout Australasia, ED comparisons relating to service delivery have largely focused on triage code allocation and the associated 'seen by doctor' times, patient case-mix and mortality and presentation rates. However, ED staff have been concerned that service comparisons have often failed to accommodate the different levels of service providers. For example, rural EDs may not have a doctor on-site and so triage code benchmarks can be an unreliable indicator for service comparison between metropolitan/urban and rural EDs.

Clinical performance indicators are important and enable services to make comparisons between each other throughout Australasia. However, it is timely that consideration be given to the development of other system indicators. Examples may include time to analgesia and time to first antibiotic.[42,43] Additional performance indicators need to be identified that will maximise equitable comparisons while focusing on the patient's journey and drivers of quality and satisfaction for staff and patients. In addition, many external services (for example, radiology, surgery and pathology) contribute directly or indirectly towards the ED patient flow. These external services are often outside the control of ED staff, but may limit, impede or reduce the capacity for ED patient flow. Many external services are critical to ED patient management and decision-making, and so future external service benchmarking is needed to enhance patient flow broadly.

Emergency service (re-)design of models of care

While there has been a significant increase in ED demand, there has been little debate about patient flow and the use and appropriateness of current and future emergency staff roles, including the contribution of allied health and paramedicine staff within the ED.[14,22,44] Workload demands and workforce issues continue to dominate the healthcare debate. For example, governments have sought to drive service change through national emergency performance targets.[45]

Optimising ED workforce models to better meet service need is important given workforce projections concerning supply, distribution and skill-mix needed to meet future demands for services.[14] In Australasia, 10–60% of ED presentations have been estimated as primary healthcare patients.[46–48] A proportion of this group, both nationally and internationally, is considered to be able to be redirected to new models of care or other healthcare agencies.[49] Extensive research was undertaken of new models of care in many countries, particularly in the UK, USA, Ireland, Canada, Denmark and Sweden, and to a lesser degree in Australasia. A literature review[50] identified six practice-based new models of care:

- minor injuries units
- walk-in centres
- telephone triage and advice services
- GP cooperatives services
- primary care health centres
- ambulance services ('see and treat' and 'treat and refer').

Models were not mutually exclusive from each other, EDs or GP clinics. The outcomes of these models of care demonstrated a positive impact on acute service-use patterns.

While there was a wide range of care models beyond traditional GPs and EDs, telephone triage advice centres, minor injury units and walk-in centres were the most effective due to ease of access, convenience and prompt service delivery.[14] The evidence of impact was stronger for services co-located or streamed with EDs. In 2010, Australia opened the first walk-in centre in Canberra, ACT.[51] The widespread implementation of fast-track areas aimed at rapid assessment and care of patients with minor illnesses and injuries has been a successful strategy in facilitating timely emergency care for this patient group.[30,52,53]

A collaborative and integrative relationship between emergency staff, paramedics, GPs, nurse practitioners and other primary healthcare clinicians would enhance the timely delivery of services. Studies in the UK by Ward and collegues,[54] Dale and collegues[55] and Murphy and collegues[56] demonstrated that GPs based within an ED significantly reduced investigations, referrals, radiology and costs, and managed 16.8% of non-urgent ED presentations. Further exploration of the GP role within the ED is needed, as there was UK evidence of reduced hospital costs and emergency doctor workload. While the research is difficult to quantify, ED re-design models globally have had a significant impact on GP workload, hospital admissions and costs.

For those in geographically isolated areas throughout Australasia and New Zealand, concerns remain about healthcare equity and access, and limited healthcare options.[57] The application or impact that re-design models may have in rural, remote and regional areas is unclear. While the different models of care may benefit those living in more-isolated regions, it is difficult to extrapolate the findings of research to these areas. While a portion of these new models could be considered, others would be difficult and/or impractical to implement in geographically isolated areas. Implementation barriers and enablers have been identified within the literature.[50]

In Australia, the professionalisation of ambulance paramedics as a registered health profession is seen as a significant step to the (re-)designing of emergency services.[58] The registration of ambulance paramedics will enable significant expansion of the scope of paramedics and better position them to continue to advance their contributions to the quality of the patient experience and the quality of their care. This is particularly relevant

as it relates to paramedic clinical judgement and decision-making, which is a hallmark of professionalism.[59] In the UK, evidence has identified that extended paramedicine activities including 'see and treat' and 'treat and refer' protocols may reduce ED activity.[60,61] In 2007, paramedicine pilot 'see and treat' protocols for assessing and treating minor injury or illness in the community were evaluated.[62] This cluster-randomised controlled trial involved 56 UK urban ambulance stations and 3018 patients. The patients treated by a paramedic were less likely to be transported to an ED or need hospital admission within 28 days. The 'see and treat' paramedicine model had a positive impact on healthcare agencies, and paramedics reported high levels of satisfaction. Extended paramedicine roles were shown to redirect activity away from acute care services.

Similarly, Snooks and collegues[63] evaluated a 'treat and refer' paramedicine protocol. Patients could be assessed, managed and left at the scene with either a referral plan or self-care advice. The evaluation identified that there was no difference in the proportion of patients left at the scene in the intervention or control groups, although job time was longer for the 'treat and refer' group. Paramedicine 'treat and refer' protocols were found to be used appropriately. Further testing and validation of protocols, decision support systems and training was required.

Another paramedicine re-design model included a minor injuries unit (MIU) referral protocol.[64] This 12-month UK study introduced a protocol aimed at reducing ED activity by enabling paramedic crews to directly refer patients to an MIU. In the randomised-cluster control group, 37 people attended an MIU, 327 attended an ED and 61 were not transported. For the intervention group, 41 people attended an MIU, 303 attended an ED and 65 patients were not transported. Ambulance service job times were shorter for those attending an MIU compared with an ED. The MIU patients were 7.2 times as likely to rate care as excellent. The results suggest that paramedics make appropriate referrals to alternative healthcare agencies and thereby reduce ED activity. Extending the role of paramedics could build service capacity and job satisfaction, while redirecting activity away from acute care services.[49,58,61] The shift of paramedic education into the tertiary sector will potentially facilitate the extended-care practitioner (ECP) role. Postgraduate courses are now becoming available as well as industry-based ECP training. However, it is unclear exactly how the role of the ECP will develop in Australasia. This is discussed further in Chapter 2.

Australasian nurse competency standards

Emergency nurses require skills, specialist knowledge and expertise to meet the challenge of delivering emergency care. Various iterations of Australasian competency standards, which detail the combination of skills, knowledge, attitudes, values and abilities that underpin effective performance within a profession/occupational area have attempted to define these care dimensions. Competency standards have therefore been defined as a set of core standards that describe the current practice of nurses. Such standards can be developed to the professional levels expected of both the beginning nurse and the advanced nurse practitioner.

The Australian Nursing and Midwifery Accreditation Council (formerly the Australian Nursing and Midwifery Council) is an independent accrediting authority for the nursing and midwifery professions under the Australian Health Practitioner Regulation Agency (AHPRA). The NMBA is responsible for the regulation of nurses and midwives and, as such, takes responsibility for the national competency standards for registered nurses in Australia, providing a framework for assessment both for licensure and for universities developing curricula.[38,39] The College of Emergency Nursing Australasia (CENA) has developed these standards and from them, competencies and competency assessments may be derived.

CENA[65] has released competency standards in order to provide broad practice and performance guidelines in line with national legislation.[38,66,67] The emergency nursing specialist standards cover nine domains: clinical expertise, communication, teamwork, resources and environment, professional development, leadership, legal, professional ethics and research and quality improvement.[65] The standards represent the unique characteristics that give shape to the specialty of emergency practice. National competences have been developed within Australasia for registered nurses, enrolled nurses and nurse practitioners by the ANMAC and the NCNZ.[38,66–69] Many peak nursing and midwifery bodies have given support for these competencies.

Within Australasia, nursing and midwifery regulating authorities have established standards of competency that apply to the registration of nurses and midwives, with a focus on safety of practice. These competency standards accommodate the diverse roles that nurses and midwives undertake, provide a framework for undergraduate and postgraduate curricula, define behaviour and are a means of ensuring high-quality care through safe and effective work practices. In Australia and New Zealand, the developed and endorsed enrolled nurse, registered nurse, nurse practitioner and midwife competency standards provide a framework for ongoing professional development.

Development of emergency nursing professional bodies

To support nurses in this new specialty area, professional organisations such as the Emergency Nurses Association (ENA) were formally established in the USA (1970), UK (1972), Australia (1983) and New Zealand (1990).[70] These associations promote clinical, educational and professional development of emergency nurses by producing policy statements on levels of role performance and by fostering specialty recognition. The associations publish newsletters and provide financial sponsorship for ED nurses to attend conferences and conduct research. Many also provide introductory specialty education courses to update knowledge and skills. The *Australasian Emergency Nursing Journal,* first published in 1996 by the New South Wales ENA, became Australasia's first international, peer-reviewed emergency nursing journal. In light of the collaborative nature of emergency care, diversity of its workforce and variety of settings, the journal is known today as *Australasian Emergency Care*. State and territory ENAs have merged to form CENA, the peak professional body for emergency nurses throughout Australia with professional links to New Zealand and Singapore emergency nursing groups.[65]

Emergency nurse specialisation

Nursing specialisation was necessary because of the recognition that nurses could no longer master the volume of knowledge and skills required to work in all clinical areas.[71] To assist emergency nurses in gaining in-depth knowledge and clinical expertise, specialty postgraduate courses were developed, with the first in Victoria in 1974. In the 1970s and 1980s, these were hospital-based vocational specialty courses in emergency nursing. By 1979, professional bodies such as the New South Wales College of Nursing had extended their nursing education profile to include advanced emergency nursing programs. By 1995, university-based Emergency Nursing Graduate Certificate courses had been established in Australia.[71]

In 1985, Australian hospital-based pre-registration nurse education began to transfer to the tertiary sector, with completion for all states and territories by 1994. With the shift to tertiary education there was a corresponding demand for postgraduate tertiary qualifications.[72,73] To meet this demand, tertiary programs were developed to articulate with specialist certificate courses and extend nursing knowledge, attributes and clinical skills beyond mere technical competence. Today, Australasian universities provide postgraduate courses in specialty areas such as emergency nursing. Registered nurses can now pursue graduate certificate, graduate diploma, master and/or doctoral degrees in their area of specialisation.[72]

Today nurses are recognised and defined by their area of specialty practice, such as emergency. As a result, each specialty area has its own cultural context. While all types of nursing have similar characteristics, in each specialty there is a unique collection of individuals who share knowledge systems, including values, beliefs and ways of being that make them and their work distinct from other communities of practice.[74–76] Emergency nurses share common knowledge sets that provide understanding and bring meaning to activities, shape the boundary of emergency work and make them recognisable to each other.[77] This creates systems of meaning which allow people to build conceptual maps and orientate activity and behaviour during interaction.[77] Thus, shared information contributes towards a level of stability and coherence.[78] Within an ED, notions of efficiency, timeliness and equity shape meaning through which expectations of patient behaviour are conveyed and a culture of ED care sustained.[77] Through these knowledge sets of meaning, emergency staff come to learn, communicate and understand how practice is viewed and conducted, and how the notion of care is perceived.[32,77]

A cultural context of ED care is reflected in a standard geography of care that is orientated towards the notions of efficiency and timeliness that are shared and understood through patient movement. Patient movement is normalised by architecture, embedded expectations, urgency codes and bed allocations, and creates a spatial web recognisable to all emergency staff.[33,36] These embedded cultural mores make explicit a particular cadence of care from which a culture of ED care emanates and within which emergency nursing is enacted.[4]

Clinical roles

To keep pace with nursing specialisation across Australasia, local, state, territory and regional governments and nurse associations introduced industrial nursing awards to recognise, support and financially reward advanced clinical nurses. For example, the industrial award classification of Clinical Nurse Specialist (CNS) was introduced in NSW in 1986 and in Victoria in 1987 and Clinical Nurse Specialist 2 in 2015.[79] Inherent in this classification is the recognition that advanced level practitioners deliver and coordinate care appropriate to the needs of the patient, act as clinical resource people, provide leadership and support less-experienced staff. However, CNS award classifications did not mandate an academic qualification for the position, preferring instead to maintain the focus on clinical experience and knowledge, and professional leadership.[38,67,80] By the 1990s, other award classifications, such as Clinical Nurse Consultant (CNC) and Nurse Practitioner (NP), had been introduced and have added to the clinical career pathways open for registered nurses.[73]

These industrial award classifications meant that experienced nurses no longer had to move away from direct patient care to gain career advancement and financial incentives.[81,82] However, specialty definition, qualifications, levels of competency, accreditation processes and extended practice roles have developed without consistency or national unification throughout Australasia.[81,82] For example, emergency nurses in Australasia can expand their area of chosen professional development and can develop extended clinical nurse roles, such as a Clinical Initiatives Nurse (CIN)[31] or an Advanced Practice Nurse (APN). Other advanced emergency nursing roles include: Clinical Nurse Specialist (CNS), Clinical Nurse Educator (CNE), Clinical Nurse Consultant (CNC) and Nursing Unit Manager (NUM).[19,36,81] Extended nursing practice roles require organisational support and governance and are commonly supported by protocols or standing orders.[26]

Across Australia and New Zealand, emergency nurses have implemented innovative extended clinical practice roles to meet service demands. Hence, a wider range of patient diagnoses are being managed by nurses with specialist education to optimise patient safety.[82,83] Emergency nurses rely on delegated responsibility to enable the commencement of episodic care for extended practice roles.[30,31] A significant example of episodic care includes pain management interventions.[84,85] Given the range of extended practice roles within Australasian EDs, there is little doubt regarding the positive impact on patient and system services.[50]

Emergency nurse practitioners

Nationally and internationally, nurse practitioners (NPs) are recognised as undertaking advanced practice roles.[28,86] NPs provide leadership, expertise, support and direction within clinical settings; they undertake assessments, make diagnoses and initiate treatment within their scope of practice, and provide monitoring and care coordination for particular patient groups. Emergency NPs are expert clinicians with advanced skills and theoretical knowledge that enable them to autonomously treat, manage, refer and discharge a range of patient conditions in partnership with medical and other allied health workers.[87,88] NP authorisation requires the nurse or midwife to hold general registration, demonstrate extensive advanced clinical expertise and recency of practice, hold a master's degree and demonstrate competency in the competency standards.[89]

The NP role is well established in the USA (1960s), UK (1980s), Canada (2000) and, to a lesser extent, Australia (1995)

and New Zealand (2000). In a USA census survey, there were 234,000 authorised NPs with 23,000 being educated annually.[90] Within the role, 49.9% hold hospital privileges and 11.3% have long-term care privileges, 95.8% usually prescribe medications.[90] Within Australia (2017), there were 282,412 registered nurses[40] and approximately 1604 authorised NPs.[40] In New Zealand (2017), there were 55,289 registered nurses and 242 authorised NPs.[91]

There is national and international evidence of NP impact in relation to: contribution to workload;[26,27,92–94] appropriate care;[95–97] patient satisfaction;[98–100] documentation and guideline adherence;[101] and efficiency and timeliness.[101,102] No clinical difference was found between NPs and doctors in patient health outcomes.[103–105] Nurse practitioners were found to be more reliable in following practice guidelines and completing medical record documentation. Of note has been the positive economic impact of NP models compared with 'routine medical care'.[105–107] Cost reductions related specifically to resource use, shorter hospital length of stay and reduced patient complication and (re-)admission rates.

In Australia, regulation of NP authorisation is promoted and maintained by the Australian Health Practitioner Regulating Agency. The Australian statutory authority (the National Registration and Accreditation Scheme) and the NCNZ in New Zealand have established competency standards that apply to the authorisation of NPs.[69,108] Practice areas include metropolitan, district, regional and rural and remote centres with minimal or no doctor coverage. In 2010, Australasian NPs gained prescribing and investigation privileges which should be co-endorsed by their scope of practice and organisation. Embedded into authorisation processes are the nurse practitioner standards for practice.[39] Within Australasian universities, NP curricula embed the standards and cover care practices for acute and non-acute patient conditions and situations, physical assessment, pharmacology, procedures, leadership, and ethics and the law (see chapters 3, 4 and 12).

A lack of clarity, internationally, surrounds the NP name. The term 'nurse practitioner' was often used interchangeably with 'clinical nurse specialist' (USA), 'clinical nurse consultant' (UK) and 'advanced practice nurse'.[109–111] Consequently, for consistency greater clarity is needed to define, understand and measure advanced practitioners. Nonetheless, emergency NPs are caring for patients, from preterm to aged care, and managing acute and chronic conditions in a variety of different models of care and services. The volume, breadth, depth and consistency of research findings provide strong support for the expansion of NP roles and numbers.

Leadership and management

Those in leadership and management positions face increasing challenges in meeting service provision demand and consumer expectation. Current challenges include: sustainable access planning; overcrowding; staff recruitment and retention; and the re-design of models of care to include emergency roles, referrals and redirecting care options. While there are innovative strategies being explored to meet the challenge of service provision, success is often dependent on the ability of clinical leaders and managers to motivate, enthuse and engage with staff to drive new visions of practice.[112,113] Refer to Chapter 6 for more information on leadership.

In Australasia, sustainable access planning remains a major ED management issue.[14,114–116] Part of sustainable access planning is resolving access block issues. An 'access block' is defined as a patient who is ready to go to a ward bed, but remains in the ED for longer than 8 hours because of the lack of an inpatient bed.[103,117] This leads to overcrowding. There is an association between overcrowding, increased hospital length of stay and mortality in Australian hospitals.[114,118] Known effects of overcrowding include delays in patient management, poor hospital processes, poor infection control, patients not being placed on the appropriate ward, and so forth.[119]

Hospital strategies which aim to improve inpatient bed access include medical admission units, reforming bed management practices, discharge planning and patient processing.[120] Other complementary strategies include the development of rapid assessment teams, emergency medical units and the use of CINs, APNs, NPs, aged-care assessment teams and community and chronic disease initiative programs.[14,29,121]

The delivery of emergency care is dependent on sustaining a sufficient and appropriately skilled workforce. It is essential that the complexities of patient safety, staff recruitment, retention and the development of emergency nursing roles be made explicit to enable strategic planning to sustain and/or enhance nursing workforce density. To this end, transactional leadership can provide a basis for responding creatively to workforce issues and the reshaping of emergency nursing roles (see Chapter 6). Further continuing professional development is central for an innovative, safe and responsive workforce. Emergency managers and clinical leaders everywhere are continually finding new and innovative ways to sustain a responsive workforce to provide timely and equitable emergency care, and meet the challenging demands of contemporary service provision.

Professional development

Professional development is synonymous with terms such as evaluation, 'in-service' education, continuing education, self-directed learning, competencies, etc. The Nursing and Midwifery Board of Australia (2014) suggests continuing professional development (CPD) is the means to maintain, improve and broaden practice knowledge, expertise and competence, and develop attributes and skills to maintain professional practice and improve patient safety and outcomes.[39] CPD should be undertaken to promote more capable practitioners able to provide demonstrable improvements in patient care.[122]

CPD and lifelong learning skills are essential to providing good quality of care to patients and communities.[123–125] Research suggests that better-educated nurses are associated with better patient outcomes, with many authors espousing that CPD is crucial to patient safety and quality standards of patient care.[124,126–128] However, fewer studies acknowledge the impact that advanced education within the paramedic profession has had on patient outcomes. One area that has been extensively researched is the relationship between the practice of endotracheal intubation and adverse patient outcomes.[129–132]

Nonetheless, there is good evidence that inadequacy of professional education is associated with adverse patient outcomes. Education can be delivered correctly and effectively, and can be linked to improved patient outcomes.[133,134] It is clearly advantageous to be able to target CPD in areas of clinical need,

with learning outcomes that are desired and measurable to be able to demonstrate benefit. Failure to undertake professional development can affect patient morbidity and mortality and may also affect other important measures, such as ED length of stay and cost of care.[135,136]

PRACTICE TIP

Improved patient care is the objective of any educational strategy undertaken as a clinician. It is often difficult to measure the impact this education has on patient health outcomes, but evaluation of educational strategies should demonstrate patient benefit.

Australian and New Zealand nurses on the national register are required to participate in, and keep written documentation of, at least 20 hours of CPD per year,[39,68] although there are no quality requirements for CPD offerings, nor stipulation regarding the frequency of engagement.[137] A crucial component of developing a unique body of knowledge is ongoing or lifelong learning, both of which are central to CPD, and indeed are considered important professional traits.[124,127,138] Professional development activities include such things as undertaking policy work, involvement in quality improvement activities, research, attending conferences and subscription to refereed journals, to name but a few. In addition, formalised professional development can be undertaken in the tertiary sector in the form of postgraduate certificates, diplomas and degrees in chosen specialties. However, education course structure and content can vary within the different awards. Nonetheless, undertaking professional development tertiary qualifications in a specialist area of practice is valuable, and needs to be encouraged as it expands knowledge and skill bases required for nurses to better care for patients of increased complexity and acuity.[139] From personal perspectives, advanced or higher-level education also tends to be associated with added self-confidence, and workplace opportunity and mobility.[130]

PRACTICE TIP

Innovative strategies are required to ensure learning needs are met of practitioners working in fluid clinical environments. Similarly, educators, clinical leaders, instructors and mentors are required to be creative and flexible in educational facilitation.

Emergency nurses require advanced assessment skills to be creative and effective in problem-solving, have well-developed communication and teaching skills, as well as emotional intelligence, caring and management expertise. As a result, emergency nurses need to be constantly critiquing the care being provided and the outcome of that care. Therefore, professional development should include the support, translation or undertaking of research and dissemination of evidence-based practice (EBP).[140–143] Research findings can provide insight into and understanding of the complexity of emergency practice and the challenges experienced by emergency care staff.[140] By researching everyday nursing practice, insight is gained into the experience of emergency nurses and how they make sense of reality. From this insight, new ways to practise, educate and support health professionals can be developed.

SUMMARY

Emergency care and nursing practice have been shaped by many factors. These include advances in resuscitation and technology, recognition of emergency as a specialty practice, increased patient presentation rates, technology, population demands, increased rates of chronic conditions and changing case-mix. These factors and the growing demand on the healthcare system have increased the complexity and demands experienced in emergency nursing. The increasing focus on emergency care provides an opportunity for clinicians to collectively drive the healthcare agenda, management focus, policy direction and research agenda. In this way emergency care services can be strategically directed and reformed. There remains great capacity to reshape and redesign emergency care service delivery within Australasia. Better use of the skills, expertise and qualifications of all healthcare clinicians would go some way towards meeting the challenge for more timely and appropriate healthcare delivery throughout Australasia.

USEFUL WEBSITES

Australian Health Practitioner Regulation Agency (AHPRA). Provides information for regulation of health professionals, www.ahpra.gov.au.

Australian Institute for Health and Welfare. Australia's national agency for health and welfare statistics and information, www.aihw.gov.au/.

Nursing and Midwifery Board of Australia. Provides information for regulation of nurse professional, www.nursingmidwiferyboard.gov.au.

Australian Nursing and Midwifery Federation. Provides information and resources for health professional, www.anmf.org.au/splash/.

College of Emergency Nursing Australasia. Provides policy, guidelines and educational resources relating to emergency nurses, www.cena.org.au.

Council of Remote Area Nurses of Australia. Provides policy, guidelines and educational resources relating to rural and remote nursing and midwifery, www.crana.org.au.

Emergency Care Institute NSW. Provides policy, guidelines and educational resources relating to emergency care, www.ecinsw.com.au.

NSW Agency for Clinical Innovation (ACI). Provides policy, guidelines and educational resources relating to health care delivery, www.aci.health.nsw.gov.au/.

New Zealand Guidelines Group and Evidence Based Healthcare. Provides evidence-based guidance, tools and implementation frameworks for clinicians, www.health.govt.nz/about-ministry/ministry-health-websites/new-zealand-guidelines-group.

New Zealand Ministry of Health. Provides information for regulation of health professionals, www.health.govt.nz/.

New Zealand Nurses Organisation. Provides information for regulation of nurses and midwives, www.nzno.org.nz.

Nursing Council of New Zealand. Provides information for regulation, standards and policies for nurses and midwives, www.nursingcouncil.org.nz.

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CHAPTER 2

PARAMEDICINE IN AUSTRALIA AND NEW ZEALAND

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Essentials

- The history of organised ambulance services in Australia and New Zealand can be traced back to the late 1800s. These services provided basic care, consistent with community expectations of the times.
- There were a number of influences that were common in the development of the ambulance services. First-aiders, trained by St John Ambulance, were often the providers of ambulance services, but—depending upon their location—ambulance services were also provided by hospitals, police, industry groups, government instrumentalities and, in some cases, commercial operators.
- Early ambulance services often focused on the means of transport from the scene, rather than treatment at the scene. Over time, the mode of transport changed from human-powered Ashford litters to horse-drawn wagons, then progressed to mechanical means of transport on the land and through the air.
- In the late 1960s and early 1970s, a change in the focus of ambulance services occurred as a result of parallel developments in the way the sick and injured were treated before they arrived at hospitals.
- Advances in the care of cardiac and road-trauma patients led to the development of contemporary paramedicine practices and systems.
- Paramedics are the interface between the community and emergency department and acute hospital care, so play a vital role in improving patient outcomes from illness and injury

INTRODUCTION

History of paramedicine

Most of the ambulance services that exist today have long and varied histories. Many have their foundations in the late 1800s, and were set up by enthusiastic groups of community-minded people with an interest in first aid. St John Ambulance was an influential factor in their formation, as they were the providers of first-aid training for many of the members of these newly created ambulance services.

The increasing number of people with first-aid qualifications who were looking for an opportunity to maintain and utilise their newly acquired skills led to the formation of St John Ambulance brigades that catered for the treatment and sometimes transport of the sick and injured on a voluntary basis. However, not all ambulance services in Australia owe their origins to St John Ambulance; there were also a number of community-based groups, government bodies, hospitals and private individuals who initially provided this important function.

In their earliest days, the main role of ambulance services was to facilitate the transport of the sick and injured to hospital. The standard of care for the

treatment of these patients was at the level of basic first aid and the provision of comfort measures. Medical care was solely within the domain of doctors, who, ably assisted by nurses, provided much of the care for the sick or injured following their arrival at hospital.

Many of the advances that occurred during the early history of ambulance services related to the modes of transport that were available to facilitate the safe arrival of a patient to a hospital. The earliest mode of transport used in Australia and New Zealand was the 'Ashford litter', which could be best described as a stretcher on detachable cart wheels with retractable supporting legs. This litter owes its origin to Sir John Furley, one of the founders of St John Ambulance. His design was patented in 1875 and was known as 'St John ambulance'. However, the concept of having a system that involved the quick retrieval and transport of the injured can be traced back to Dr Dominique Jean Larrey, a military surgeon in Napoleon's army. In 1792, he developed a system that facilitated initial treatment and retrieval of injured soldiers from the battlefield to field hospitals, where they were treated by military surgeons. The system required the use of lightweight horse-drawn carriages that entered the battlefield and swiftly removed the wounded, taking them to a designated location set up to treat the injured, often situated behind the battle front. These carts were called 'flying volantes' and later became known as 'flying ambulances'.[1] Larrey's approach was, in essence, the principle upon which modern-day trauma systems are founded.

Over time, the Ashford litter was replaced by horse-drawn vans, wagons or carts, but not before the litter was adapted to enable it to become bicycle-powered. The Ashford litter was certainly an improvement on a stretcher carried by two stretcher-bearers, although ultimately its successful utilisation was determined by the patient's proximity to the hospital and by the state of the roads and pathways upon which it was to be deployed.

As motor vehicles became increasingly popular and more affordable, their potential for use by ambulance services was obvious. They were able to transport patients to hospital more quickly and cover greater distances. Initially, trucks, upon whose flat tray the sick and injured were placed, were used by some services, while other services utilised 'fitted out' motorised vans equipped with stretchers (Fig. 2.1). Eventually special vehicles were commissioned by ambulance services and built by coach and body builders on a truck chassis. Much later, passenger vehicles and station wagons were modified to satisfy the unique requirements of ambulance vehicles, thus significantly reducing the cost of new purchases (only modifications were required instead of the need for completely new designs) as demands for service increased and old-model ambulances in fleets that had exceeded their 'use-by' date were replaced.

Over time, ambulances became more specialised, and bespoke vehicles were developed by some ambulance services to meet the specific needs of the communities that they served. During the 1918–19 Spanish flu epidemic and during wartime, tram carriages[2] were transformed into multi-patient modes of transport to move patients to either infectious disease centres or military hospitals. In the Australian outback, motorised rail trikes have been used to transport patients between outlying towns and regional centres.[3] Boats have been adapted to be used in aquatic environments. Planes and helicopters have made a significant contribution to the ability to quickly transport critically ill or seriously injured patients, and is covered in more detail later in this chapter.

FIGURE 2.1 An early-model motorised ambulance c. 1910–1920

Courtesy of NSW Ambulance.

It is easy to see why the modern-day paramedic was often referred to as an 'ambulance driver' in much earlier days. Staff, either employed or volunteers, who had mechanical ability were highly regarded by ambulance service managers. A first-aid certificate was often the only qualification that was required to become an ambulance driver, the precursor of the modern-day paramedic.[4]

Historical overview of paramedicine by jurisdiction

New South Wales

New South Wales has the earliest documented ambulance service in Australia, dating back to 1881 when the Board of Health, in response to a smallpox epidemic, organised a transport service to a hospital for infectious diseases for patients located on the outskirts of the Sydney urban area.[4] While a number of hospitals developed their own ambulance services, there were also localised, community-based and industrially orientated groups that provided ambulance transport services.[4] One of the largest and best organised of these groups was the Civil Ambulance and Transport Brigade (CATB). It was established in 1895 and is generally regarded as the original ambulance group from which the present-day Ambulance Service of New South Wales developed.

St John Ambulance also played a part in the original development of ambulance services in the state. While its main role at this time was to provide first-aid instruction, it did fund the provision of an Ashford litter that could be used to transport the sick and injured. By 1900 St John Ambulance had provided 14 such litters, which were strategically positioned around the

city of Sydney. It wasn't until 1912 that the CATB took delivery of its first motorised ambulance.[5]

In the early part of the 20th century, CATB became the Civil Ambulance and Transport Corps (CATC) under the auspices of St John Ambulance. A number of other ambulance services also existed during these times, and rivalry between CATC and other suburban services led to the government of the day enacting legislation to create the Ambulance Transport Service Board via the *Ambulance Services Act 1919*. In 1925 the Central District Ambulance Service (CDAS) was formed, based in the Sydney region. In the years that followed, ambulance services in regional areas replicated the service delivery initiated by CDAS. In 1972 all these services were united together when the *Ambulance Service Act* came into being. This Act created a statewide ambulance service with a common administrative framework, known as the New South Wales Ambulance Service. Later its name was changed to the Ambulance Service of New South Wales. To this day, it remains under the control of the state's Department of Health.

Victoria

The first ambulance service in Victoria commenced in 1896 when St John Ambulance placed an Ashford litter at the Eastern Hill Fire Station, Melbourne's main fire station, staffed by trained assistants.[4] It is from this single event that Victoria's state ambulance service grew. Initially the fire brigade provided the service for free, but as demand increased their board sought recompense for the service. Government grants initially assisted the financing of this vital service, but in 1902 the Chief Secretary refused requests for further grants, declaring that police would provide the service using hansom cabs (horse-drawn taxis) and Ashford litters.[4]

Ambulance services continued to be provided, and became increasingly expensive as the method of transport changed from human- and horse-powered transportation to that provided by automobiles. In 1916, the Victorian Civil Ambulance Service (VCAS) was formed. Although legally separate from the St John Ambulance, there was a high degree of cross-membership between the two organisations. Over time, VCAS became the main provider of ambulance services in Melbourne and its surrounds. In 1922 a 'country division' was formed to service and support the development of ambulance services in rural and regional areas. This 'country division' was a loose alliance/amalgamation of rural and regional ambulance services and continued until the Victorian Hospital and Charities Commission established regional ambulance boards in 1955, making the 'country division' redundant. VCAS continued until 1973 when the state government restructured ambulance services and created an entity called Ambulance Service Victoria. In 1986, the *Ambulance Service Act* established the Metropolitan Ambulance Service (MAS) and Rural Ambulance Victoria (RAV); RAV was divided into further administrative and operational regions. In July 2008, MAS, RAV and the Alexandra and District Ambulance Service were amalgamated to form Ambulance Victoria, thus creating a single ambulance service for the entire state.[4]

Queensland

The Queensland Ambulance Transport Brigade (QATB) came into existence in 1902.[4] This organisation has its origins in the City Ambulance Transport Brigade, established in 1892. Many of the members of this Brisbane-based group had a strong affiliation with St John Ambulance, having gained their first-aid qualification from them. Over time QATB prospered and enjoyed a great deal of community support, allowing it to extend its operations to other metropolitan locations and regional centres.

In 1916 QATB took over the St John Ambulance Queensland Centre and became the agent for the Order of St John in Queensland. Ambulance services continued to develop as a result of community endeavour and these brigades were very parochial in nature, with the fund-raising activities that supported their services forming part of the social fabric of many communities.[4]

From the time QATB was established until 1967, ambulance services came under the *Hospitals Acts* of 1923 and 1944. The *Ambulance Services Act 1967* provided a separate legislative framework for ambulance services, and specified that local area committees were to be formed and a State Council established as the regulatory body of QATB.

QATB, which had a large number of single brigades operating within it, became the Queensland Ambulance Service, as we know it today, in 1991, when the brigades amalgamated.[3] The level of training and equipment available to each brigade differed according to each local committee's fund-raising acumen and the economic conditions of the time. It was once stated that 'when there were 96 brigades the only thing in common was the colour of the shirts'.[4]

Western Australia

In 1903 the Perth metropolitan fire brigade began an ambulance service using a horse-drawn van. In the same year the police acquired an Ashford litter. In the following years, ambulance services spread to industrial workplaces as Ashford litters were located at wharves, railway workshops and railway stations. By 1910 all the major railway stations in Perth had an Ashford litter located in their vicinity. Four Perth municipalities also had their own horse-drawn ambulance services.

As a result of the increasing workload associated with providing ambulance services, the fire brigade decided to concentrate on activities associated with fire-fighting and reduce their involvement in the provision of non-core business. In 1922 St John Ambulance took over formal control of the Perth metropolitan ambulance service, later expanding its activities throughout the state. A second metropolitan ambulance centre was established in Fremantle in 1929. During the 1930s approximately 50 ambulance centres were established throughout the state, and by 1970, the number of ambulance locations had risen to 96. By the late 1980s there were 17 metropolitan ambulance depots and 105 locations outside the metropolitan area. Some ambulance services in remote locations chose to remain outside the St John umbrella, but these were few in number.[4]

South Australia

The early history of ambulance services in South Australia is not well documented.[4] Up until the early 1950s there was no unified system as in the other Australian states; rather, there was a 'haphazard series of small, independent and uncoordinated services in the capital city, Adelaide, as well as in the State's other cities and regional centres'.[4]

In 1951, the state government outsourced ambulance services to the St John Council for South Australia Inc. Prior to this government initiative, metropolitan Adelaide was serviced by a collection of organisations. These included the South Australia Ambulance Transport Inc (previously Hindmarsh Volunteer Ambulance), Northern Suburbs Ambulance Association, the Civil Ambulance run by the police department and Joe Myren's Private Ambulance. St John Ambulance amalgamated these services, and over the next few decades developed regional and rural services to such a degree that by the 1970s South Australia had a state-wide service similar to those existing in most other states of Australia.[4]

The *Ambulance Service Act 1992* legislated responsibility for ambulance services to a joint venture between the Minister of Health and the Priory in Australia of the Grand Priory of the Most Venerable Order of the Hospital of St John of Jerusalem. In 2005 it became known as the South Australian Ambulance Service (SAAS), and in 2008 SAAS officially became part of South Australia Health.[4]

Tasmania

Tasmania's first ambulance service began in Launceston in 1915 when the proprietor of the local livery stable had a horse-drawn ambulance van built.[4] In 1922 the responsibility for this service was transferred to the local municipal authority, which engaged the fire brigade to operate the service. During this time, Hobart City Council had also established an ambulance service to serve that city.

By the 1950s there were 13 regional and local boards operating a total of 33 ambulance vehicles. Each board acted independently of the others with little or no coordination between any of the providers. This lack of coordination, along with differing standards of training and equipment and widespread community dissatisfaction, finally led to the state government establishing an Ambulance Commission, whose role was to oversee all these services.

The state's Minister for Health persuaded the St John Council for Tasmania, based in Hobart, to take control of ambulance services. Within two years, St John provided ambulance coverage to about two-thirds of the state's area, along with services to most cities and main towns. A number of issues affected the ability of St John to provide their planned service, and in 1965 they announced they would withdraw from the provision of ambulance services. An external consultation reviewed the state's ambulance service and it was recommended that the government take direct control. Thus the Tasmanian Ambulance Service came into being, changing its name to Ambulance Tasmania in 2013.

Australian Capital Territory (ACT)

Canberra has had an ambulance service since about 1915 when construction on the nation's capital began.[4] In 1925 the Federal Capital Commission (FCC) was established, with one of its roles being to commission an ambulance service.

By 1930 the FCC had been abolished and the local fire brigade organised the service that was to become known as the Canberra Fire and Ambulance Service. In 1955 the Canberra Ambulance Service came into existence under the control of the Commonwealth's Department of Interior. It soon changed its name to the ACT Ambulance Service. In the next year, control of the service was handed to the board of the Canberra Community Hospital. In 1989 the ACT became self-governing and the service was brought under the control of the ACT Emergency Services Authority.[4]

Northern Territory

Ambulance services in the Northern Territory were initially provided and run by the local hospitals in its two main towns, Darwin and Alice Springs.[4] The first motorised ambulance commenced in 1929, and continued for some time. In the early 1950s, St John Ambulance provided 'after hours' ambulance services.

The outstanding assistance that St John Ambulance service was able to provide during Cyclone Tracy (in 1974) and its aftermath became a catalyst to draw together the various Public Health Department ambulance services in an effort to provide a unified service throughout the territory. In 1977 the Northern Territory government passed control of the ambulance services to the St John Ambulance Council of the Northern Territory, which proceeded to develop a territory-wide service encompassing all the main cities and towns of the territory.[4]

New Zealand

There were predominantly four providers of ambulance services in New Zealand: St John Ambulance, Wellington Free Ambulance, and the Taranaki and Wairarapa District Health Boards. St John Ambulance is responsible for ambulance services that cover just over 85% of the nation's land mass. The establishment of St John in New Zealand was first mooted during a public meeting in Christchurch in 1885. By 1889 Christchurch had four Ashford litters based at police and fire stations. They were more fortunate than the people of Auckland—in 1892 St John reported that the equipment there consisted of a stretcher and a set of bandages, but fortunately by 1903 their fleet had expanded to nine litters. In the same year, the city of Dunedin formed the first division of the St John Ambulance Brigade and began to provide first-aid services.[4]

St John rapidly established itself throughout New Zealand, proving especially popular in localities where medical services were scarce and where the local industry was labour-intensive. In 1975 the government of the day revamped the Ambulance Transport Advisory Board, resulting in St John reviewing their ambulance service activities. Staff were encouraged to obtain and eventually required to hold formal qualifications. The days of patients being tended to by ambulance personnel who held a basic first-aid certificate were over.[4]

Since 1927, the people of Wellington and its surrounds have been the beneficiaries of free ambulance transport from the Wellington Free Ambulance, an organisation that claims to be the only free ambulance service operating in the Southern Hemisphere.

Evolutions in pre-hospital care

Peter J Safar MD (1924–2003)[6] made a significant contribution to the development of pre-hospital emergency care throughout the world. He is known as the 'father of CPR' (cardiopulmonary resuscitation) and is credited with identifying the Airway and Breathing elements of the ABC of resuscitation. Some of his notable achievements were: the establishment of the first

intensive-care unit in a hospital in the United States; assisting in the development of the first advanced life support (ALS) ambulances; and assisting in the development of the 'Resusci Anne' manikin. Most important, however, was his role in the modern history of emergency medical services—he organised one of the first, if not *the* first, pre-hospital emergency medical services in the USA.

In 1967, Freedom House Enterprises commenced a paramedic service in Pittsburg, Pennsylvania. It was a welfare project with a two-fold purpose: to provide an ambulance service to an impoverished area, and also provide employment and training to unemployed members of a minority group. This project led to a partnership between Dr Safar and Freedom House Enterprises, an outreach of the United Negro Protest Committee. The 'Freedom House Ambulance Service' trainee paramedics were African-American men and women drawn from the ranks of Pittsburg's unemployed.[7,8] The resultant ambulance service provided the most sophisticated emergency care to one of the most disadvantaged groups of people in the United States.

In 1974 Dr Safar appointed Nancy Caroline (1944–2002)[9] as medical director of Freedom House Ambulance Service. She was to become a prominent author of textbooks for paramedics. For many years her first textbook, now in its seventh edition, was the only one specifically written for paramedics. The 1975 report she prepared for the US government played a significant role in the development of the first national paramedic training course. To many she is affectionately known as the 'mother of paramedics'.[10]

In early 1966, in Belfast, Northern Ireland, Frank Pantridge MD (1916–2004), who has sometimes been called the 'grandfather of pre-hospital ALS', set up a mobile intensive care unit to assist in the management of patients with myocardial infarction. He recognised that in cases of cardiac arrest due to ventricular fibrillation, the defibrillator needed to be brought to the patient rather than the patient brought to the defibrillator.[11] No portable defibrillators existed at this time, but Pantridge utilised some technology developed by the NASA space program to develop a lightweight, portable defibrillator capable of being carried to the scene of a cardiac arrest by paramedics.[12] His ground-breaking program confirmed that it was possible to treat cardiac arrests that occurred outside hospitals. As a result of this work, similar programs in many centres were set up throughout the developed world over the next decade.

In 1971, the Mobile Intensive Care Ambulance (MICA) program was set up in Victoria. This was the first MICA system in Australia and the third in the world after Belfast, Northern Ireland and Seattle, Washington. Initially a paramedic and a medical registrar staffed the MICA vehicle, but by 1973 the medical officer was replaced by another suitably trained paramedic, making it a 'paramedic-only' response (Fig. 2.2).

By the late 1960s and early 1970s, paramedic programs had either begun planning for their implementation or had commenced in a number of locations. Most notably were the centres of Miami, Florida under the guidance of Eugene Nagel MD; Seattle, Washington overseen by Leonard Cobb MD; Los Angeles, California, with medical director Ron Stewart MD; Portland,

FIGURE 2.2 An injured worker in a rural setting being treated by first-responders and paramedics.

Courtesy of NSW Ambulance.

Oregon; and Nassau County, New York. There were two major influences on the development of such paramedic programs. The work of Pantridge in Northern Ireland inspired a number of cardiologists to become advocates for the advanced treatment of myocardial infarction and cardiac arrest outside the hospital setting. This was to occur in multiple locations throughout the world in the decade following Pantridge's initial research and successful implementation of a coronary care program. Similarly, another quiet revolution occurring in pre-hospital treatment related to the care of the trauma patient. At about the same time Pantridge was implementing pre-hospital coronary care in Belfast, US legislators were enacting laws to improve patient outcomes from automobile trauma. The *National Highway and Safety and Traffic Act 1966* funded the development of a national curriculum for pre-hospital personnel, as well as distributing funds to improve emergency medical services in the United States.[13] Importantly, the national curriculum that was developed included CPR instruction. This, along with the observation that US servicemen injured in Vietnam could be evacuated, on average, in 35 minutes from time of injury and be in surgery within 1–2 hours with an overall mortality rate of just 2.3%,[14] added impetus to the call for improvements in pre-hospital trauma care. The stage was now set. The treatment of both trauma and coronary care patients was to become the domain of the modern-day paramedic.

The ALS program that had begun in Los Angeles became the basis for the TV series *Emergency!* The series ran from 1972 to 1977 in the United States and was subsequently syndicated throughout the world. It was inspired by a TV producer who, while scouting a location for a new TV show, heard firefighters who spoke like doctors on a visit to a hospital's emergency department (ED). These firefighters were in fact paramedics in the new ALS program. A seed was planted for a new TV show centred on the exploits of two fictitious fire-fighters, Roy de Soto and John Gage, who worked out of 'Squad 51' in the Los Angeles County Fire Department. The interactions with their patients and the ED staff of the fictional Rampart General Hospital provided the dramatic setting for the new weekly show.[15] The show increased the general public's awareness of the role of a paramedic and by 1975, 46 out of 50 states had paramedic programs operating.[13] The technical advisor to the series was, in real life, a fire chief named James O Page.[16] He ensured that artistic licence did not take precedence over authenticity when technical aspects of the paramedic role were part of the storyline. Page was later to become the founder of the widely read *Journal of Emergency Medical Services*.

Air ambulance services

In nations that are either as sparsely populated as Australia or as challenged by its unique topography and weather as New Zealand, it is easy to see why air ambulance services have become a key component in the day-to-day functions of ambulance services.

Australia

Australia owes its rich tradition of air ambulance services to the Reverend John Flynn OBE (1880–1951). In 1928, he organised an air ambulance service as a year-long trial, based at Cloncurry in Central Queensland. The service proved so successful that it was adopted throughout rural and remote Australia. Within the next decade, operations had extended to Victoria, NSW, South Australia, the Northern Territory and Western Australia. Currently the Royal Flying Doctor Service (RFDS) provides aircraft, pilots and engineering resources to the ambulance services of NSW, Victoria and Tasmania.[17]

Originally called the Australian Inland Mission Aerial Medical Service, Flynn's concept was to provide a 'mantle of safety' to the residents of the outback where your next-door neighbour might be 100 kilometres away. True to its original charter, the RFDS remains a 'not-for-profit' organisation that provides both emergency assistance and primary healthcare for patients unable to readily gain access either to hospitals or to a general practice.

Australia has embraced the use of helicopters as an adjunct for providing quick transport for the trauma patient to the most appropriate hospital, as well as for providing an efficient retrieval service for patients already in hospital but requiring more specialised care at a major referral hospital. A number of public and private enterprises conduct these services throughout Australia and New Zealand. In Australia, some are heavily sponsored by business enterprises, such as large banks and insurance companies, as a community service; others are 'for profit' enterprises contracted by state governments or state ambulance authorities to provide commercial helicopter operations.

New Zealand

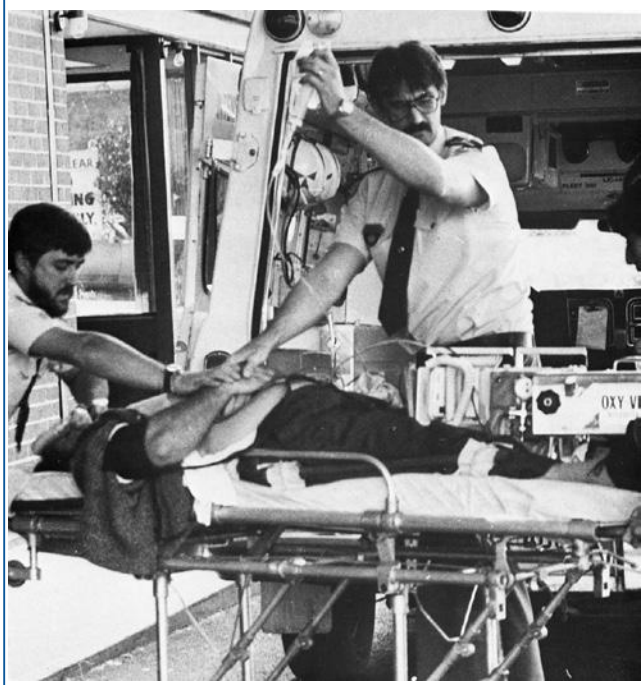
New Zealand's air ambulance services began later than those in Australia; it is only since the 1980s that there has been a significant increase in the use of aircraft to complement the largely road-based ambulance sector. The clinical crews manning many of these services are provided primarily by the road-based ambulance services. The driving factor in forming many of these services often occurred as a response to a significant local incident. This led to a high degree of community 'ownership' of the services, with local community donors and corporate and grant funders being key stakeholders.

Services in New Zealand are operated by a combination of charitable trusts and private companies located throughout the country. Almost 60% of the revenue for emergency helicopters comes from sponsorships, grants and donations. The Crown, along with District Health Boards and the Accident Compensation Commission, provides another 34% of revenue.

Role of volunteers in pre-hospital care

Australia is a large country in terms of land mass, yet has a population density of just under three people per square kilometre—one of the lowest concentrations of people to land mass globally. Its topography is among the lowest, flattest and driest of the continents with its population highly concentrated on the south-eastern sea border. New Zealand, a nation consisting of two main islands, has a much smaller land mass and a population density of approximately 16 people per square kilometre. Its topography is different from Australia's, in that mountainous regions dominate, along with some large coastal plains.[18] Due to the large proportion of sparsely populated areas of Australia and New Zealand, both countries have had a rich tradition of volunteerism from their earliest days to the present time, and this has extended to the provision of ambulance services. The Council of Ambulance Authorities Inc. (CAA; collectively Papua New Guinea, and all New Zealand and Australian ambulance

FIGURE 2.3 Intensive-care paramedics treating a patient in the late 1970s.



Courtesy of NSW Ambulance.

services) estimates that there are 12,220 volunteers working in New Zealand and Australian ambulance services, which accounts for approximately 45% of the entire workforce.[19]

Volunteers are engaged in both urban and rural areas. In urban and metropolitan areas up until the last few decades, volunteers have served their communities alongside their salaried counterparts by assisting in the staffing of after-hours services and making themselves available at times of peak demand. In rural and remote areas, the only cost-effective ambulance service that was available was one staffed either predominantly or entirely by volunteers. In these communities, the role of the volunteer paramedic varied. In some locations, it was a community responder role (Fig. 2.3), providing care to the patient prior to the arrival of an ambulance from a location further away, while in other communities there were volunteers who had both treatment and transport capability.

In the metropolitan and regional areas today, volunteers have largely been phased out, whereas in regional and rural areas volunteer paramedics provide a vital first link in the provision of emergency care for many of the residents of Australian and New Zealand rural communities. Given that these areas are sparsely populated and have a low workload, it is easy to understand why a full-time service with salaried staff is not justified. The goal for ambulance services will always be to recruit, retain and train volunteers to serve these communities.

The ambulance volunteer is similar to other Australian volunteers in terms of age and gender. In research conducted as part of a study of volunteer ambulance officers in Australia and New Zealand, volunteers stated they enjoy both the training and the opportunity to maintain their skills. sustained by an enjoyment of helping people and making friendships within the group.[20] The difficulties facing ambulance volunteers are lack of time and the inadequate provision of resources.[20] Ongoing training and skills maintenance are critical to maintaining volunteer competence and currency. Most volunteer services now use part of the Australian Qualification Training Framework, associated with the National Training Framework, in a structured approach to ensure that consistent standards and assessments occur in line with vocational education.

When delivered well, training can be a powerful motivator. Conversely, if done poorly it can be a great deterrent to the process of recruiting, engaging and retaining volunteers. The challenge for ambulance service managers is to provide the resources that allow just the right amount of training in just the right amount of time to keep the volunteer committed to the role of providing ambulance services in their local community.

Current status of paramedicine

The primary goal of any discipline in health and medicine, whether emergency medicine, general practice, nursing, allied health or paramedicine, is to reduce pain and suffering and restore health. This goal is supported by most ambulance service mission statements, which identify that the health and wellbeing of the community is achieved through the efficient delivery of high-quality pre-hospital patient care and specialised patient transport services. Today most ambulance services have a long history and culmination of modernisation and upgrading of services provided to the community.

An emergency medical system (EMS) is identified as a comprehensive network that delivers prompt health services to victims of sudden illness or injury, with their aim being to deliver the patient to the most appropriate facility in the most appropriate time.

Globally, healthcare providers are striving to deliver the best emergency medical systems. While each country has its own systems, protocols and guidelines, most can be categorised by role title or scope of practice; Basic Life Support (BLS) or Advanced Life Support (ALS).

The title given to a member of an ambulance service has varied across Australia compared with New Zealand. Prior to the late 1980s, paramedics were commonly referred to as 'ambulance officers' in most states and territories of Australia. Historically, the term 'paramedic' has not been enshrined in legislation, so virtually anyone can call him or herself a paramedic. In December 2018 this changed in Australia, with the introduction of national registration, which included the protection of the title 'paramedic'. Only those registered as a paramedic are now entitled to call themselves a paramedic. The primary role of paramedics is to treat trauma and medical emergencies outside the hospital setting and during transport to the most appropriate medical facility. They also transfer patients between various healthcare facilities. A number of services have programs in place that allow paramedics to provide primary health as well as emergency care. Each ambulance authority has titles for their staff based upon the level of care that they can provide, but there is no common nomenclature used across Australia or New Zealand. Many terms are used, but there is, in most cases, a degree of similarity between terms for ambulance operatives with similar skill sets. These are outlined below.

First responder

An individual who is training in advanced first aid and responds to emergencies to provide initial management in the pre-hospital setting.[21]

Patient transport attendant

An individual who has completed training in first aid and patient transport and who provides care and transport to patients with lower acuity conditions, often between health facilities.[21]

Paramedic

Paramedics are health professionals who provide rapid assessment, treatment and transport in the pre-hospital setting. In Australia and New Zealand they are usually degree qualified.[21] They are competent in BLS, with enhanced skills that include defibrillation, advanced airway management, intravenous cannulation, administration of analgesia, antiemetics and hypoglycaemic agents, cardiac and respiratory drug therapies and intravenous fluids. They are capable of maintaining intravenous infusions, patient assessment, including pulse oximetry, vital sign assessment and cardiac monitoring (ECG).

Intensive care paramedic

A paramedic with advanced training, usually at the postgraduate level, who provides advanced assessment, treatment and transport of patients with higher acuity injuries or illnesses.[21] They possess advanced airway skills, and are credentialled to administer a wider range of medications and interventions than paramedics. They practise under either clinical practice guidelines or approved protocols, depending on their jurisdiction.

Flight paramedic/retrieval paramedic/critical care paramedic

These paramedics work on either fixed-wing or rotary-powered aircraft. They perform emergency, retrieval and routine transports. Most are trained to the level of an intensive-care paramedic, but have additional training in rescue techniques and aviation medicine. Registered nurses with postgraduate qualifications staff some fixed-wing air ambulances completing mostly retrieval operations. In some states the rotary-powered aircraft are staffed by a combination of a doctor and a flight paramedic.

Extended care paramedic/General care paramedic

The extended care paramedic (ECP) is a relatively new type of paramedic who is able to attend emergency cases and provide advanced care and can also attend patients with subacute and non-acute healthcare needs. The ECP has additional training at a postgraduate level in the application of a range of clinical pathways assessment and management that may not result in the patient being transported to an ED. Working together as a team, ambulance services, and in fact emergency health models more broadly, work best when each component contributes to a system of care. Working as part of a team in the pre-hospital setting is not only critical to better patient health outcomes, but also to connecting patients to the right care, in the right time-frame.

The following case study illustrates the important role each level of care within the pre-hospital setting has to play in ensuring optimal health outcomes for people sustaining serious injuries or illness.

CASE STUDY

Miss A is a 12-year-old girl and a keen equestrian, who lives in rural Victoria. At a weekend gymkhana she was competing in a cross-country race with her gelding, Sinbad. As Miss A and Sinbad were about to leap over a large fallen tree trunk, Sinbad was spooked, and inadvertently tossed Miss A over the tree trunk where she landed heavily on the ground. She was unconscious and despite several people (including her mother) attending to her quickly, she was unarousable.

A gymkhana official immediately called 000 (Australia's emergency number) and requested an ambulance. While the ambulance call-taker was collecting additional information and providing first-aid advice, they alerted the ambulance dispatch area of a potentially time-critical case. The ambulance dispatcher immediately notified their duty manager and clinician (intensive care paramedic working with an operations centre with responsibility for clinical oversight and advice) of the case, given the acuity of the patient and the remoteness of the incident. The ambulance dispatcher also dispatched the closest first responder and paramedic crews. The first responders were approximately 20 minutes from the incident and the paramedic crew was 30 minutes. The nearest Helicopter Emergency Medical Service (HEMS) was also dispatched, with their crew consisting of an intensive care flight paramedic, a paramedic and a pilot. The HEMS crew were 40 minutes away from the incident. Police were also dispatched to assist with scene control and to communicate with HEMS regarding appropriate landing sites.

On arrival of the first responders, they were able to provide advanced first-aid measures, take a full history (from the bystanders and the patient's mother), and undertake a patient assessment, including a full vital signs survey. They immediately positioned Miss A on her side, applied a cervical collar, provided stabilisation of her neck, spine and airway, and commenced oxygen therapy. Their secondary survey assessment revealed no obvious injuries, apart from some abrasions around her head and face. They provided a situation report (sitrep) to the communications centre, updating the centre and crews of the patient's condition, vital signs and management initiated.

Following arrival of the paramedic crew, the first responders were able to provide a detailed handover. The paramedic

crew undertook a further secondary survey and reassessed all vital signs. The paramedic crew provided a second sitrep, updating the communications centre and the HEMS crew. Given the mechanism, and that the patient was tachycardic (HR 140) and hypotensive (BP 70/40), they decided to apply a pelvic splint. A formal assessment of conscious state revealed Miss A remained unconscious and did not respond to pain. Her Glasgow Coma Scale score was 7 (eye opening = 1, verbal response = 2, motor response = 4). The paramedics carefully repositioned the patient into a supine position, inserted a supraglottic airway without incident and connected a bag–valve–mask resuscitator to the airway. The child continued to breathe spontaneously with good tidal volume and oxygen saturation remained greater than 98%. The paramedics commenced transfer of the patient onto a vacuum mattress at the same time as they could hear the helicopter circling overhead.

After the helicopter had landed and shut down, the intensive care flight paramedic arrived and received a handover from the paramedic crew. She requested another set of vital signs, quickly reassessed the child's conscious state, and assessed the abdomen. Given there was no improvement in blood pressure and heart rate, the flight paramedic inserted an intravenous cannula, commenced the administration of intravenous fluids, and asked the helicopter crew member to set up for a rapid sequence induction (RSI). RSI is an emergency airway management technique using medications to induce immediate unresponsiveness and muscular relaxation. The flight paramedic decided that RSI was required to protect the child's airway in flight (and prior to getting airborne), and to control oxygenation and ventilation in this child with a closed head injury. With the aid of the paramedic crew, the flight paramedic intubated the child using a RSI technique, and the child was loaded into the aircraft. The child was transported to the nearest paediatric major trauma service.

These type of cases occur daily in ambulance organisations that service large populations. Optimal outcomes for patients are reliant on a system that allows teams of care providers to work together and harmoniously. Each care provider knows and is proficient at their role, and understands the roles of others who are critical to the system.

Career structure

The career structure for paramedics can be broadly divided into three streams; clinical, management and education/research. The Australian Qualifications Framework provides very broad discipline-free nomenclature,[22] which is associated with many roles within each of the three streams commonly encountered within paramedicine (Table 2.1).

Regulation of paramedicine

Registration of paramedics in Australia and New Zealand has been actively pursued by the profession, ambulance associations and paramedic colleges since the early 2000s. This is an important development, given that the discipline delivers a health service and regulation would be in the best interests of the public. Regulation schemes have been established to ensure the safety of consumers who receive care from registered health practitioners. In Australia, the *Health Practitioner Regulation National Law and Other Legislation Bill 2017*[23] was passed by the Queensland Parliament in September 2017, paving the way for the inaugural Paramedicine Board of Australia to be established under the auspices of the Australian Health Practitioner Regulation Agency (AHPRA).[24] The Paramedicine Board of Australia is one of 15 national boards, one each for the 15 health professions that form part of the National Registration and Accreditation Scheme (National Scheme). Broadly, the National Scheme is responsible for protecting the public, and registering students and practitioners. Registration opened for paramedics in September 2018, and the participation date for paramedics as a registered health professional commenced on 1 December 2018. Regulation of paramedicine has a number of benefits under the National Scheme. These include the protection of the title 'paramedic', national mobility for registered paramedics, development of registration standards and approval of paramedic qualifications and programs of study.

In order to practise as a paramedic following registration, paramedics must satisfactorily meet five standards. These mandatory registration standards relate to:

- criminal history
- English language skills
- continuing professional development
- recency of practice, and
- professional indemnity insurance arrangement.

In addition to the standards, the Paramedicine Board of Australia will apply several codes and guidelines that will provide guidance to the profession in the areas of:

- mandatory notifications to the Board
- code of conduct
- guidelines for advertising regulated health service, and
- social media policy.

Continuing professional development (CPD) is important for healthcare professionals from all disciplines, and will be one of the standards the Paramedicine Board of Australia will be considering prior to registration. Paramedics will need to complete at least 30 hours of CPD each year, and maintain a portfolio that documents learning goals and completed CPD activities.[25]

The future of paramedicine

The range and complexity of clinical interventions utilised by paramedics has expanded considerably over the last few decades. Furthermore, we have seen paramedic education shift largely from in-service and vocational training to the university sector. Focus will continue to be on paramedic-driven research contributing to the pre-hospital evidence base for clinical practice. The

TABLE 2.1 Career structure within paramedicine linked to Australian qualifications framework levels

STREAM	ROLE	AQF LEVEL: Level 4 Cert IV	Level 5 Diploma	Level 6 Advanced Diploma	Level 7 Bachelor Degree[2]	Level 8 Graduate Certificate / Diploma	Level 9 Masters Degree	Level 10 Doctoral Degree
Clinical	First Responder							
	Patient Transport Attendant							
	Ambulance Transport Attendant							
	ALS Paramedic[1]							
	Intensive Care Paramedic[1]							
	Flight / Retrieval Paramedic[1]							
	Extended Care Paramedic[1]							
Management	Frontline Manager[1]							
	Senior Manager							
	Executive							
Education and Research	Paramedic Educator / preceptor[1]							
	University Lecturer							
	Research Fellow							
	Professor of Paramedicine							

[1]With the introduction of Paramedic Registration in Australia and New Zealand, each of these roles will require professional registration

[2]Some universities offer double degrees in paramedicine and nursing or paramedicine and public health.

role of the paramedic is currently expanding beyond emergency response, into areas such as primary healthcare and population health. A patient-centred approach, which takes into account the needs and values of patients and consumers, is being embraced by many ambulance services. All healthcare must be patient-centred, and informing and involving patients in decisions about their care and disposition (GP, ED, other healthcare professional) not only results in an improved patient experience, but has been associated with improved health outcomes.[26] Pre-hospital advancements in technology and availability of point-of-care testing will dramatically change the way paramedics assess, manage and refer patients. Telemedicine will have a great impact on the way paramedics practise, increasing the capability of consulting with other specialities and participating in 'shared' decision-making in terms of appropriate management and choice of patient destination. Some advancements in practice are already making positive outcomes. These include the introduction of focused assessment with sonography in trauma (FAST) into pre-hospital trauma models, pre-hospital thrombolysis and mobile stroke units. There is certainly scope for further improvement of current processes and expansion of practice, including:

- direct referral of first-time seizure patients to neurology departments
- improved accuracy of call-taking and dispatch systems
- increased health system integration including referral to alternative healthcare providers
- stroke and neuroprotective drug pilot programs
- diagnosis and early treatment of sepsis.

CASE STUDY

Mr C is a 72-year-old male and lives at home with his wife and dogs in a regional centre in Australia. Mr C was walking his dogs at approximately 9 am one morning with his wife when he suddenly felt pain in both his hips. He sat down and shortly became unresponsive.

A young male bystander realised he was in cardiac arrest and called the ambulance emergency phone number. The ambulance call-taker provided the bystander with real time CPR instruction via his mobile phone. The patient was attended by the local mobile intensive care ambulance

(MICA) unit and MICA single responder and the first paramedic crew arrived 4 minutes after they were dispatched. The patient was found to be in ventricular fibrillation, and resuscitation was commenced with the assistance of the bystander. Over the following 9 minutes paramedics continued CPR, defibrillated Mr C five times, inserted a supraglottic airway and administered intravenous medications (adrenaline (epinephrine) and amiodarone).

Mr C then achieved return of spontaneous circulation (ROSC), remained unconscious and was intubated using paralysing drugs (RSI). A 12-lead ECG revealed an acute anterolateral ST elevation myocardial infarction (STEMI). The Helicopter Emergency Medicine Service (HEMS) was activated because the attending crew identified that his cardiac arrest was likely to be secondary to his STEMI, and that he would be likely to benefit from going to a large hospital with interventional cardiologists and a cardiac catheterisation laboratory; the closest interventional cardiology service was approximately 200 kilometres away. Mr C was administered pre-hospital thrombolysis (PHT) and stabilised while awaiting the HEMS, with the use of intravenous adrenaline (epinephrine) to achieve an adequate blood pressure and sedative agents to ensure the patient remained comfortable and pain-free.

The HEMS arrived within 20 minutes, landing on a football oval nearby, and received a handover from the attending paramedics before loading the patient into the helicopter. The receiving hospital was notified of the impending arrival of Mr C. On arrival, he was immediately transferred to the cardiac catheterisation laboratory and angiography showed moderate-to-severe occlusion of several coronary vessels (50% occlusion of mid left anterior descending artery (mLAD), 65% occlusion of his dominant left circumflex artery LCx). He had normal functioning of his left ventricle. Mr C had coronary bypass graft surgery (×3 vessels) on day 8 following his cardiac arrest. He was transferred back to his local base hospital for rehabilitation 21 days following his cardiac arrest. Mr C was discharged from rehabilitation without any serious deficit following his cardiac arrest.

Questions

1. Which component of the 'system of care' was the most important for Mr C in the case study described above?
2. What were the different levels of paramedic involved in Mr C's care, and what were the differences in their scope of practice?

Answers to Case Study Questions can be found on evolve
https://evolve.elsevier.com/AU/Curtis/emergency/

SUMMARY

Pre-hospital care has evolved considerably over time, with perhaps the most substantial change occurring over the last two decades. No longer is the paramedic considered a 'stretcher bearer', but rather an integral link in the healthcare system. The scope of first responders and paramedics in the pre-hospital setting is continually expanding in order to address the changing needs of our communities and the healthcare system. In addition, paramedics now work in an ever-expanding range of settings and roles, but are most commonly associated with emergency ambulance systems. With professional regulation and registration fast approaching, the future role of paramedics and their contribution to the broader health system is exciting. Paramedics are now commonly engaged in driving the healthcare agenda through consultation on policy, regulation, education and research.

USEFUL WEBSITES

Paramedics Australasia, the peak professional association representing practitioners who provide paramedic services to the community, www.paramedics.org/.

Australian and New Zealand College of Paramedicine, a professional body that offers knowledge, events and community to those who work in the paramedicine field in Australia and New Zealand, www.anzcp.org.au/.

Paramedicine Board of Australia, regulating Australia's paramedics, supported by the Australian Health Practitioner Regulation Agency (AHPRA), www.paramedicineboard.gov.au/.

St John New Zealand, the largest emergency ambulance service in New Zealand, www.stjohn.org.nz/.

Wellington Free Ambulance, provides a free paramedic service for the Greater Wellington and Wairarapa region in New Zealand, www.wfa.org.nz/.

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CHAPTER 3

CLINICAL ETHICS FOR EMERGENCY HEALTHCARE

ELEANOR MILLIGAN, SARAH WINCH AND DAVID HUNTER

Essentials

- Remember the values that inform your practice. Why are you in healthcare?
- Slow down … where possible.
- Ethically sensitive care happens in *every* interaction you have with your patients and colleagues, and is not limited to resolving the big dilemmas.
- There are many ways to harm a patient—patients may remember the 'moral harms' (of feeling excluded, ignored, uncared for, or misunderstood) long after their physical illness subsides. Act to minimise *all* harms.
- Every action in an organisation either contributes to or undermines its ethical culture; choose your actions carefully.
- Treat yourself, your colleagues and your patients with kindness.
- Seek help if you are struggling with the ethical aspects of your professional role.

INTRODUCTION

> We are discussing no small matter, but how we ought to live. *Socrates, in Plato's Republic*
>
> Medicine being simultaneously the scientific and humanistic study of man cannot escape being based in an explicit or implicit philosophy of human nature. *ED Pellegrino, in 'From medical ethics to a moral philosophy of the professions'*[1]

Most societies recognise healthcare as a fundamental 'good'—something of great value that is collectively nurtured, protected and preserved. Human communities, even ancient ones, developed traditions of healthcare ranging from the diagnoses and treatments offered by medicine men and shamans within indigenous communities to the healing traditions provided within Chinese medicine, Islamic traditions and the early Western tradition of medicine derived from the ancient Greeks. These formalised systems of healthcare delivery, and the collective desire to improve and progress medical knowledge, flow from the recognition that the preservation of life and good health are integral to every person's ability to flourish.

While life is valued and we collectively (through the provision of organisational care) and individually (through personal choices) seek to maintain health, the human body is fragile, subject to illness, disease and trauma. In the context of medical emergency, healthcare professionals are called on to respond to the needs of patients at times of unexpected trauma, in addition to expected and unexpected illness. Often patients are in distress, possibly confronting their own (or loved ones') mortality. They enter the healthcare system seeking skilled and competent treatment and, importantly, reassurance, understanding and 'care' in the true sense of the word. The families and loved ones of patients similarly look to emergency healthcare professionals for reassurance that the trust placed in them to provide

care is deserved and will not be misused. Hence, for healthcare to be effective, health professionals and the organisations in which they operate must be worthy of the trust placed in them; that is, they must be trustworthy.

At such times when the fragility of life is a stark reality for patients and their families, the ethical response of emergency healthcare professionals is triggered by the personal vulnerability that comes hand-in-hand with illness and trauma. Illness is not simply a matter of physical threat to the body; it is equally a threat to a person's sense of identity and wellbeing—who they are, and how others see them, their future possibilities and present capabilities. It is this vulnerability of the ill person that invites a caring response from healthcare professionals. Barry Hoffmaster[2] writes that 'vulnerability is an even more basic feature of our human constitution than rationality, because while all human beings are vulnerable, not all are rational or even possess the potential to become rational … it is our very vulnerability that creates the need for morality'. Thus, healthcare, including the provision of emergency healthcare, occurs within a moral relationship between the carer and the cared for. It is 'ethically laden practice'[3] because it requires healthcare professionals to respond to the needs of others at times of personal fragility and disempowerment, and to care for patients and families, both in the physical and in the human sense.

While emergency healthcare shares this ethical foundation of providing care and relieving suffering with other healthcare disciplines, it also raises particular and unique ethical challenges. The physical landscape of emergency and trauma care is one in which a pre-existing relationship with the patient often does not exist, potentially impeding critical understandings on both sides. Frequently, organisational resources are limited, creating ethically confronting situations such as 'ramping', where patients are unable to be handed over from ambulance staff to be triaged in hospital emergency departments (EDs), or poor response times where the best care possible is unable to be given. The inherent unpredictability of emergency, the need to make time-pressured treatment decisions and the professional isolation of emergencies in rural practice can create ethical tension. Similarly, community expectations that emergency healthcare staff will respond to the needs of others and even compromise their own safety in times of pandemic or natural disaster can breed fear and resentment in practitioners. Confusion over what to do when a patient lacks capacity or does not appear to have given appropriate informed consent can generate anxiety and unease in healthcare professionals. Decisions concerning the instigation of futile treatment can also generate moral distress. Added to this mix are the hierarchical structures within healthcare organisations that can negatively shape interprofessional communication, sometimes to the detriment of patient care. All of these considerations define the unique and complex environment of emergency and trauma care; all can lead to moral anguish in the individual practitioner; and all can contribute to stress, burnout and even poor retention in the workforce.[4] However, when clinical staff develop the skills and tools to work through, understand and engage with the ethical and human dimensions of their practice, they can become more effective, both personally and professionally.

Ethics: an ancient and evolving field

A working knowledge of the approaches available to understand ethical issues is important because it clarifies the emergency healthcare professional's role in ethical situations and the associated decision-making. There are many different ethical perspectives, and considering a clinical scenario through these different lenses can lead to different outcomes.

Ethical concepts drawn from the classical, modern and post-modern centuries of thought are useful tools for understanding, explaining and deciding how to resolve contemporary ethical issues. In this brief review, we consider four of the more well-known approaches to understanding ethics: virtue ethics, deontology, utilitarianism and narrative ethics. For a more detailed discussion on ethical theory, a number of good texts are available, such as *Ethics in nursing: the caring relationship*[5] and *Ethics and law for the health professions*.[6]

This chapter begins with a brief review of the ethical theory from which the principles for ethical practice and decision-making are drawn, then considers the role of professional codes of ethics and codes of conduct in guiding practice. All approaches have strengths and weaknesses; hence, in a given clinical situation the ability to recognise and use these various ways of thinking can help you navigate the ethical aspects of care. It concludes with an example of one model of ethical decision-making that may assist health carers in developing their skills of ethical analysis.

Virtue ethics

Ideas from the ancient Greek philosopher Aristotle (384–322 BC) underpin *virtue ethics*, an approach that has seen resurgence in popularity since the publication of *Modern moral philosophy* in 1958.[7] Virtue ethics, in common with Aristotle's thinking, focuses on inner character and/or motives rather than rules or consequences of actions. Virtues are qualities that make their possessor good: a virtuous person is a morally excellent or admirable person who acts and feels well. Virtues are not innate in a person, but can be cultivated. Thus, moral education and the development of a virtuous character are central to virtue ethics.[8] The ethical or moral character of an individual develops over a long period of time and can be encouraged by family, teachers and the peer group. Professional education plays an important role in developing moral character. For example, it is a requirement of a variety of undergraduate health degree programs to teach ethics as part of the core curriculum. The inclusion of ethics tutoring creates an educational space in which healthcare providers can extend and consolidate understanding of how their existing values and beliefs can be actualised in the professional context. Such education can also be an opportunity for personal transformation and growth. Moral training can also be provided by role models, such as senior staff in healthcare organisations, who are expected to model ethical behaviour.

Duty-based ethics and utilitarianism

The age of modernity, commonly understood to have begun with the Enlightenment in the 18th century, promoted *rationalism* (the capacity for human reason), *universalism* (truths that can be applied to all) and *individualism* (valuing the individual). These ideas have influenced contemporary approaches to ethical decision-making. Deontology, drawn from the work of Immanuel Kant (1724–1804), takes its name from *deon*, the Greek word for

'duty'. Deontological, or duty-based ethics, examines the nature of actions and the will of agents, rather than goals achieved. That is, a person has a duty to perform particular actions and to do the right action for its own sake. We see this in the well-accepted notion that healthcarers have a duty to care for patients, no matter what the outcome.

Utilitarianism, conceptualised initially by Jeremy Bentham (1748–1832) and developed further by John Stuart Mill (1806–73), refers broadly to the greatest happiness (or good) for the greatest number. It is known as a consequentialist theory in that it judges an act as morally right or wrong depending on the consequences of that act. This argument is frequently applied to modern resource allocation in the notion of getting the best value out of scarce resources.[9] The ethics of triage can be understood as a form of utilitarianism. If our ultimate goal is to give the best care possible for all patients in the ED, then the sickest patients need to be seen first. If we used an alternative method to prioritise patient care, such as when the patient actually arrived in the ED as opposed to their clinical need, then some patients would suffer significantly poorer outcomes. Resources in the ED are finite and the system of seeing patients according to their clinical urgency actually provides the greatest good for the greatest number in terms of patient outcomes. An enduring criticism of taking a purely utilitarian approach is that needs and perspectives of marginalised or minority groups become discounted or silenced when the majority rule. This can have particularly devastating impacts on already vulnerable groups.

Narrative ethics

Narrative ethics acknowledges the *subjective* nature of ethical and moral aspects of any situation. It differs from other philosophical approaches that seek to uncover universal truths through the systematic and objective application of rational thought to ethically challenging circumstances. The narrative approach seeks to uncover each individual stakeholder's personal story as a rich way of understanding their individual perspective and life. Taking a narrative approach, moral rules and principles can be best understood in the context of each person's circumstances, and the subjective meaning each individual places on particular aspects of their situation.[10,11] Narrative ethics draws its concepts and methodologies from literary criticism and phenomenology and is a postmodern approach to understanding ethics.

An example of a clinical situation in which a narrative approach may be useful is in considering the ethical issues surrounding domestic violence that emergency care workers face in their practice.[12] In such cases, the emergency care worker needs to hear the patient's story to make sense of the situation and the moral rules that may influence the patient's life, which may be significantly different from the care worker's values, beliefs and expectations. For example, the emergency care worker might be concerned about a young adult patient who presents regularly to the department with injuries that indicate they may be experiencing domestic violence. The care worker feels that it is their moral duty to counsel the patient to leave this situation and seek a safer place to live. Using a narrative approach, the care worker listens to the patient's story and is told that the patient is staying in the situation in order to protect younger siblings. The care worker can now gain an appreciation of the complexity involved. The patient feels they have a moral duty to stay and protect their siblings; the care worker is concerned for the patient. In this case the care worker may decide to support the patient to stay in their situation and put into place actions that help protect them and their siblings.

The ethical framework of emergency healthcare: our moral commitments and obligations

> Our practices … are the visible manifestations of invisible values.
>
> G HOFSTEDE, IN CULTURE'S CONSEQUENCES: INTERNATIONAL DIFFERENCES IN WORK-RELATED VALUES[13]

A useful starting point for all healthcare workers when confronting ethical decision-making is to examine the values that they hold as individuals. Values are embedded deeply in our psyche, developing from our family, schooling and cultural background. Further education and experience will shape and sharpen these values considerably, particularly through the enculturation into the professional norms and values of healthcare practice. These are then expressed consciously or unconsciously in the work environment. Values have three components: emotional, cognitive and behavioural. This means that when our values clash with what we see or hear, we are likely to feel upset or worried about what we see happening. This feeling can be made worse if we feel we have little control over the situation, which may be the case in many emergency presentations. A simple example that may challenge us is the case of the 30-year-old alcoholic single mother who is admitted with liver failure following a wild drinking binge the night before. Her two children are with her and look malnourished and dishevelled. This case challenges values that we hold regarding self-care and monitoring, as well as care of children.

In cases such as these, it is timely to remind ourselves of the professional values that we hold. These are often articulated in professional codes of ethics, and are a good reference point to guide our attitudes and subsequent clinical practice. The International Council of Nurses first developed a Code of Ethics in 1953, which is now in effect for all nurses in Australia (since March 2018).[14] Box 3.1 contains the preamble, which reflects the four fundamental responsibilities and broad values the nursing profession considers essential. The Australian Nursing and Midwifery Council initiated their Code of Ethics in 1993, which was revised in 2008. From March 2018 it was replaced by the International Confederation of Midwives Code of Ethics for Midwives.[15] More recently (in 2018), the Nursing and Midwifery Board of Australia (NMBA) released an updated Code of Conduct for Nurses,[16] founded firmly in the values of nursing which promote person-centred care, culturally safe and respectful care of all patients, integrity, compassion and honesty. Paramedics Australasia has also developed a Code of Conduct[17] to guide practitioners (see Box 3.2). In late 2018, paramedics became registered health professionals under Australia's National Registration and Accreditation Scheme (NRAS). They are now subject to the Paramedicine Board of Australia Code of Conduct,[18] which is founded in the values of practice outlined in Box 3.2.

These codes encompass the ethical aspects of everyday care. Importantly, they also communicate a shared professional

BOX 3.1 The ICN Code of Ethics for Nurses[14]

Preamble

Nurses have four fundamental responsibilities: to promote health, to prevent illness, to restore health and to alleviate suffering. The need for nursing is universal.

Inherent in nursing is a respect for human rights, including cultural rights, the right to life and choice, to dignity and to be treated with respect. Nursing care is respectful of and unrestricted by considerations of age, colour, creed, culture, disability or illness, gender, sexual orientation, nationality, politics, race or social status.

Nurses render health services to the individual, the family and the community and coordinate their services with those of related groups.

BOX 3.2 Paramedics Australasia Code of Conduct[17]

Members of Paramedics Australasia ascribe to the following principles:

- Integrity
- Respect
- Responsibility/accountability
- Competence
- Consent for patient care
- Confidentiality
- Research
- Ethical review.

See www.paramedics.org/code-of-conduct/ for expanded comments on each principle.

standard to the community. They can provide a framework for determining whether certain behaviours have breached the expected professional standard of care. Codes are often criticised for their broad aspirational statements, for being self-generated and self-monitored within professions, and for lacking independent critique. Professional codes of ethics and conduct are not legally binding. They do not provide a means of sanctioning individual professionals who do not abide by them. Legislative pathways to deal with negligent actions or poor professional standards are discussed in Chapter 4. Despite their limitations, however, codes of ethics play a critical role in expressing the underlying values of healthcare practice, while assisting clinicians to develop a shared understanding of their collective moral obligations and to develop a strong professional culture. They can also act as a touchstone to anchor clinical practice and practitioners back to their purpose.

In addition to considering aspects of clinical ethical decision-making, healthcare professionals also need to be aware of the research ethics codes that govern the conduct of research involving patients, colleagues and others. In Australia, the *Statement on ethical conduct in research involving humans*, issued by the National Health and Medical Research Council (NHMRC),[19] provides ethical guidance for conducting research. The NHMRC outlines four fundamental principles that must be considered in determining whether any research proposal meets the ethical standards expected by the community. The four principles are: that the research must have *merit and integrity*; it must be done *justly* (without unfairly burdening or including/excluding particular groups); it should be carried out with *beneficence* (designed to minimise the risks, harms or discomfort to participants); and should *respect* participants as having intrinsic value, not as a means to a research agenda. Similarly, the Health Research Council of New Zealand has published *Guidelines on ethics in health research*.[20]

BOX 3.3 The four principles to guide ethical decision-making[21]

- **Respect for autonomy**—respect people's decisions and values.
- **Beneficence**—help people.
- **Non-maleficence**—don't harm people.
- **Justice**—treat like cases alike; distribute benefits and burdens fairly.

Ethical decision-making

While codes provide general guidance for healthcare professionals, specific guides to moral decision-making and problem-solving also exist. The 'four principles' approach developed by Tom Beauchamp and James Childress[21] (see Box 3.3)—also known as 'principlism'—is popular in the healthcare field because of its accessibility and ease of application.

Based on a combination of common moral theory, virtue ethics and utilitarianism, the four principles seek to guide reflection and decision-making within the context of the specific duties that healthcare professionals owe to patients. These duties are seen to be *prima facie*. This means they are always considered to be in effect, in all situations. While Beauchamp and Childress[21] made it clear that all of the principles should be considered equally, in practice many clinicians tend to place the principle of patient autonomy above the others.

A simple example of how these principles may be applied is to consider a patient who needs a blood transfusion but refuses because this violates her religious beliefs. Using the principlist approach there are two ethical principles in conflict—the right of the patient to decide her own treatment (autonomy) and the duty of the healthcare professional to provide the best assistance possible (beneficence). If the patient is deemed competent to make the decision (that is, she is an adult with capacity), the patient's right to refuse the treatment because of her religious beliefs would be absolute, and to treat her without consent, in the name of beneficence, could result in a charge of assault or battery. If the patient in this scenario is a child, the situation would be considered differently. Children are not automatically considered to have the legal capacity to make autonomous decisions. If a parent requests the withholding of a life-sustaining treatment from their child, this poses a very serious situation that emergency staff need to report immediately

to senior staff; it may require legal intervention, particularly if the child's life is at risk.

While this approach to ethical decision-making appears straightforward, it has been widely criticised for oversimplifying what are inevitably complex and multifaceted deliberations and viewing the 'problem' primarily from the clinician's perspective.[22,23] The attributes that make this model so accessible, such as the temptation to simplify and reduce the complexity, and to decontextualise difficult ethical decisions, are also its greatest weakness. Pullman[24] suggests that principlism may be better thought of as a sort of 'first aid' response, which may be helpful in the immediate term, but cannot fulfil the role of thorough exploration.

Autonomy and informed consent

Seeking informed consent from a patient demonstrates respect for the patient as a person and for their ability to act autonomously when participating in healthcare. For informed consent to occur, the patient (or the patient's representatives if they are a minor or lack capacity) needs to understand:

- the health intervention that is being proposed
- what alternatives are available, and
- the risks attached to any course of action.

In addition, a patient should be able to act freely in choosing or rejecting proposed health interventions without undue influence or control by others.[25,26] Consent may be implied, such as when a patient rolls up their sleeve to receive an injection, or can be assumed in a true emergency situation where delaying care may cause serious or permanent harm.[27] The legal aspects of the Doctrine of Necessity (Emergency) are discussed more fully in Chapter 4.

Australian law recognises that individuals aged 18 years and over have full legal capacity, such that they are capable of making decisions relating to their own healthcare. Prior to that age, parents (or legal guardians) are entitled to consent to their child's medical and dental treatment. A parent's authority in this respect is not, however, absolute, as the law in Australia recognises that children become increasingly competent as they move towards adulthood. In New Zealand, the age for consent is 16 years. Below this age, parents and guardians are responsible for giving consent. Parents and healthcare professionals should consider the parents' and guardians' responses carefully. Childress[28] provides the following guidance for clinicians to evaluate this response. Do they have adequate knowledge and information to make the decision? Are they emotionally stable and able to make reasoned judgements? Is the decision in the best interests of the child? In this complex area of ethical decision-making, junior staff need to alert senior clinicians and managers who can assist them. In turn, senior staff may have to seek legal opinion for the correct course of action. Competent minors may be able to give consent if they demonstrate understanding of the decision and its consequences; however, this must be decided on a case-by-case basis, as there is no prescribed age below 18 at which a child may be considered a 'mature minor' in Australia; similarly, those below 16 in New Zealand can give or refuse consent if considered competent to do so.

BOX 3.4 A model for ethical decision-making[6]

- Identify the ethical problem.
- What facts are available?
- Consider the ethical principles.
- Consider how the problem would look from another perspective or using another theory.
- Identify ethical conflicts.
- Consider the law.
- Make the decision.

Model for ethical decision-making

When healthcare professionals experience competing ethical considerations, or a choice between two competing good outcomes, and are not able to resolve them, they are often left feeling burdened.[29] Box 3.4 details a general model of ethical decision-making that clinicians in Australia have found useful in such cases. This model draws upon a number of the ethical approaches discussed earlier in this chapter and provides a useful framework for health carers to use in their practice. For a more detailed discussion of this method see Kerridge, Lowe and Stewart.[6]

In emergency and trauma care, clinical ethics questions arise urgently and often without any prior established relationship with the patient or family. It is sometimes difficult to ascertain the patient's preferences for treatment when they are unaccompanied and unable to speak for themselves. This may hinder the application of ethical decision-making frameworks that are of use in other healthcare settings. One key aspect is to try to slow the decision-making process to allow all the options to be considered for the patient and if necessary to secure additional information about the patient's preferences and wishes. In end-of-life situations, where the patient may or may not be able to consent or refuse treatment, the emergency care worker needs to be aware of the laws guiding end-of-life intervention in the geographical area where they practise. Chapter 4 considers these issues in more detail.

Ethical decision-making in practice

The following discussion applies the ethical decision-making framework outlined in Kerridge et al[6] to a particular case.

CASE SCENARIO

You are in the ED when a patient is brought in by paramedics. The patient is a 48-year-old male, Lincoln, who has widely disseminated kidney cancer, including multiple abdominal and cerebral secondary tumours. He is experiencing widespread malignant abdominal ascites and pleural effusion, making breathing and communication difficult. He is clearly approaching the end of life, but has no advanced planning documentation. He is also in pain. He is accompanied by

his wife Sarah, who informs you that she holds his enduring power of attorney (Lincoln confirms this).

ED medical staff are clear that the ascites and pleural effusion should be drained to enable respiration and reduce the pain Lincoln is feeling. He can then be admitted to the palliative care unit for appropriate end-of-life care. Sarah is adamant that Lincoln wants to end his life, and requests increased morphine to make her husband comfortable. She is anxious, sarcastic and angry.

Meanwhile, Lincoln's pain is increasing. Despite his brain tumours he appears to have the capacity to make decisions regarding his healthcare and he is also requesting the morphine for his pain. He clearly states that he does not want any more tubes stuck in him. He does not consent to the drainage procedures. The doctors argue that this is an emergency case and consent is not required. You are aware that patients with capacity can refuse treatment, and feel that the patient and his wife's wishes should be upheld and a morphine infusion started as requested. You communicate these views to the others, who counter that Lincoln cannot really have capacity because of his cerebral metastasis and that if he was fully cognisant he would consent to treatment. Further, his lung capacity is now so compromised that his oxygen saturation levels are dropping. Meanwhile, Sarah is getting more and more angry and threatening to call a friend who is a health lawyer to 'sort things out' and 'witness and document' this lack of care and compassion towards her husband. The relationship between Lincoln and Sarah and the treating team is becoming fraught. What should happen next?

Identify the ethical problem

Ethical problems may be considered as those arising from an imbalance or misuse of power, or from a clash of underlying values. In this case we might consider the following points:

- The patient has refused consent to the proposed medical treatment and this may hasten his death. The aim of the treating team is to preserve life.
- The patient's wishes not to receive any more active treatment are in conflict with the preferred action of the treating team, which is to relieve physical symptoms by draining fluid.
- Can staff override his autonomy, and use their power in this situation to impose the drainage procedure?
- The patient's cognitive capacity, and thus his ability to make healthcare decisions, has been questioned due to the unconfirmed possibility of brain metastasis and low oxygenation.
- Ask yourself whose interests are served by questioning the patient's capacity. The patient or the treating team?
- The patient and his wife are in a very vulnerable position: Lincoln is dying. They sense there may be an imposition of an unwanted treatment and may be feeling increasingly helpless due to the power imbalance in this context.

The initial question that must be resolved in this scenario is whether Lincoln has capacity. While this is largely a clinical determination, the answer to this question influences all subsequent deliberations. If he has capacity, his refusal to consent to treatment must be respected. If he doesn't, he has a clearly appointed substitute decision-maker in Sarah, who is affirming his stated position of refusal of the procedure and request for pain relief only.

What facts are available?

- Lincoln is the patient.
- Lincoln is in the end-stage of a terminal illness.
- He is dying; he appears to know and accept this.
- He has not consented to the drainage procedure.
- He appears to have capacity, but this is being questioned.
- The presence of brain metastasis is not confirmed.
- His wife is his substitute decision-maker.
- He is in pain.
- He has requested sedation.
- There is some disagreement among the treating team.

Consider the ethical principles

If a patient's autonomy is being respected, they will participate in shared decision-making with clinical staff at all times. This means that all efforts should be made to determine whether the patient is capable of engaging in decisions about their care. ***The law makes the fundamental presumption that all adults have capacity until proven otherwise***. If Lincoln has capacity, his wishes and refusal to consent must be respected. If he doesn't, we must look for ways to ascertain what his wishes are likely to have been. He has clearly appointed a substitute decision-maker in his wife, Sarah, to act in his best interests, in the way he would have wanted, and clinical staff must trust that he made this appointment in good faith. However, if Sarah appears to be making requests on his behalf that appear not to be in his best interests, her status as substitute decision-maker can be legally challenged. In this case, both Sarah and Lincoln are making the same request for pain relief, even if this shortens his life, and in refusing the drainage procedure.

Acting with beneficence means seeking to do good for the patient. What 'good' means to the patient can only be ascertained by communicating with the patient and his wife, in seeking to understand what aspects of the proposed intervention they perceive as harmful. Occasionally, what the patient perceives as 'good' and what the clinical staff regard as 'good' conflict. Disagreement over what is the best course of action should not be a trigger to question a patient's capacity.

Non-maleficence, or not causing harm, can also only be determined by taking into account what the patient perceives as harmful. Would the drainage procedure inflict additional pain and suffering on a person who has already endured enough? To what end is this procedure being performed? Are we really acting in his best interests by imposing an unwanted procedure, even if this procedure may relieve some of his physical symptoms? Does lengthening the patient's life, perhaps by only a few days, warrant the imposition of this procedure when the extreme discomfort the patient is feeling can be managed another way?

Consideration of justice usually refers to issues of resource allocation and the costs associated with patient care.[6] In a case like this, where the patient is at the end of life, the difference in life span as a consequence of this intervention may not represent a significant cost of care. In our healthcare system, considerations of cost are not usually the primary driving factor in determining what treatments are made available to patients.

Consider how the problem would look from another perspective or using another theory

- The key stakeholders in this case are the patient, his wife and members of the treating team.
- The patient has stated he is tired of being treated, saying he *does not want any more tubes stuck in him.*
- His wife is *anxious, sarcastic and angry*, possibly already in a phase of anticipatory grief.
- Members of the team may feel that their professional relevance and credibility is being undermined by a non-compliant patient.
- Healthcare staff may feel that the patient is under-equipped to make a good decision in such circumstances, and their desire to achieve the best health outcome for the patient may encourage them to act in a paternalistic way—to look for ways to override his stated wishes.
- Paramedical staff may feel guilty that the patient is now in a situation where his options are becoming more limited, and question their role in bringing a palliative patient to the ED.
- Consider what outcome delivers the best outcome for most people. Answering this question depends upon subjective interpretations of what 'best' means in this circumstance. It also depends on whose perspective is privileged when deciding who among the 'most' count. As Verkerk and collegues[30] note, 'Man has almost limitless ability to convince him/herself that what s/he wants to do is morally justifiable'. The skill of ethical decision-making is the ability to see the problem from perspectives other than your own, to understand, then respectfully accept and negotiate difference.

Identify ethical conflicts

- There are a number of ethical conflicts—between the patient, his wife and the treating team. There are also interprofessional conflicts within the treating team, who disagree over the best course of action.
- The powerful voices within the team have a desire to intervene and relieve pain and suffering.
- The patient and his wife are rejecting the intervention.
- The different type of psychological pain and suffering being experienced by the patient and his wife demand equal consideration, but appear not to have been heard by all members of the clinical team.
- In this case, the conflict could be represented as existing between preservation of the autonomy of the patient and the desire of the treating team to do good for the patient.
- Interprofessional disagreement within the clinical team has not yet been resolved constructively.

Consider the law

- The first question that must be clarified is whether the patient has capacity. If he does, his wishes should be respected.
- If he doesn't, his wife, who is his nominated substitute decision-maker, can make healthcare decisions on his behalf, within the law, and in accordance with his values and beliefs. Lincoln doesn't have an advance healthcare plan, but this would only come into effect if he lacked capacity.
- Sarah has the legal authority to make decisions for him, as though he were making them.
- Although Lincoln has arrived in hospital through the ED, this situation may not be a medical emergency negating the need for consent. Treatment in an emergency can *only* be undertaken to the point that averts the emergency; additional treatment without consent should not be initiated. Sarah has requested sedation for her husband. This is not illegal in Australia: sedation can be given for the purpose of relieving pain. If an unintended consequence of such pain relief is that an imminent death occurs more quickly, this is legally acceptable, provided that the primary purpose of administering the drug is for pain relief only.

Make the decision

- Lincoln appears to have capacity and you cannot impose the procedure on him. To do so would constitute an assault or battery. If this is unclear, you may request an independent assessment. In some situations, due to time pressures or lack of appropriate personnel, this might not be possible.
- In general terms, if the patient has made a decision, appears to understand it, is not coerced, and can communicate the decision, they are regarded as having capacity.
- You cannot override Lincoln's request, even in the ED, as he is in a position to make his wishes known. In an emergency, you can only act to the extent that the emergency is averted. You cannot intervene beyond this without patient, or substitute decision-maker, consent.
- A clinician cannot administer morphine for the sole purpose of hastening death. However, pain relief that has the unintended consequence of hastening an imminent death may be administered, but only with the primary intent of relieving pain.
- You should reassure Lincoln that even though he has rejected the treatment advice of the treating team, he will not be abandoned; he will receive appropriate and ongoing care, including pain relief in the last days of his life.
- Document your decision and conversations with the patient and his wife.
- Reflect on this decision and consider what you can learn for future care of patients in similar situations. You may reflect upon constructive ways to resolve disagreement within the treating team when the immediate pressure has subsided, to equip yourselves as a professional community to better cope in the future.

Initially, this process may seem onerous and overly complex; however, as you become more experienced you will learn to